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Screening reading, writing and numeracy learning problems in Bahraini young children aged 5-7 years old

By

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Dedication

This work is dedicated to the memory of my grandmother Shamma Hamad whom I missed very much in my life.

Abstract

This study is conducted on Bahraini preschool and grade 1 children aged 5-7 years. The main aim was to develop a reliable and valid test to identify the children's learning problems in reading, writing and numeracy. The second aim was to investigate if the children who experience difficulties on academic tasks use coping strategies to deal with the demands of the tasks. The finding was that the test is more reliable when the sound of the letter is used in the test instead of either the sound or the name of the letter. A low value of specificity indicates that the test is useful as a diagnostic confirmatory screening test. The model of the additive risk showed that two or more areas of the test predict future learning problems. In reading, both the scores on identifying the shared sound in the beginning and at the end of two words had the same strength in identifying the children with learning problems. In concept of print, the scores on identifying the back of the book was the most discriminating between the two groups. In writing, copying the diamond shape was the most discriminating item. In numeracy, skipping an item in counting discriminated between the two groups. The children who had difficulties on the test used "on task" and "avoidance" coping strategies. The children who did not do well in 3 to 4 areas of the test used coping strategiesand they did not reach competency in the school at the end of the year. These coping strategies were negative in the context they were used. The tasks on identifying the initial sound in a word, writing one's name, and counting predicted future learning problems.

In the implication, the items which identified the children with learning problems, and predict future problems could be included in the assessment procedure in Bahrain. The preschool and primary school teachers could be trained to use the test, and provided with the list of the negative coping strategies.

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1 Introduction

1.1 Introduction

This chapter is the first chapter in the thesis. I begin with some information on assessment in early childhood education. In the second part I describe the development of the education system in Bahrain. I include in this section details of the special education service in Bahrain. Thirdly, I discuss the research problem. I focus on the right of children with learning problems in having an appropriate education within the education system. I emphasize that part of the problem is the absence of a database on learning problems for researchers and the lack of a screening test in literacy and numeracy at an early stage. I introduce the possibility that some children with learning problems develop some coping strategies if their learning problems are not tackled at an early stage. Fourthly, I provide my own observations on some learning problems. Lastly, I state the outline for the rest of the thesis.

1.2 Assessment in early childhood

Assessment is a process of gathering information in order to make a decision. Childhood assessment is important. This part consists of five subparts. The first subpart is on the purposes of assessment in early childhood. The second subpart is on the methods of assessing young children. The third subpart is on the context of the assessment. The fourth subpart is on the focus of the curriculum. The fifth subpart is on the link between early childhood assessment and early intervention.

1.2.1 Purpose of early childhood assessment

There are many purposes for early childhood assessment. First, it provides information on the child's interest. Second, it identifies the well-developed areas in the child and the areas which need more attention (Anastasi & Urbina, 1988; Cohen & Spenciner, 1994 in Allen, 2007). Third, it assists in finding out what the child knows in the areas of reading, writing and numeracy, and what he does not know based on the developmental age criteria. Fourth, it provides information which can be used to construct an appropriate intervention program for an individual child or a

group of children. Sixth, educators in curriculum planning and teaching fields could use the knowledge from the assessment as a guide in planning a developmental appropriate curriculum, teaching and learning environment that promote children's progress (Meisels, & Provence, 1986; Shepard, Taylor, & Kagan, 1996; BUILD, 2005; Squires, Bricker, & Twombly, 2003 in Allen, 2007). The assessment also provides them with information on how well the teachers teach, and how well the children learn (Kellough & Kellough, 1999 in BUILD, 2005).

1.2.2 Methods of assessing young children

The assessment could be formal or informal. The formal assessment must be reliable and valid (with reliability and validity coefficients of around 0.8). It should be standardized. The procedure must be administered in the same way, whenever it is used (Squires, Bricker, & Twombly, 2003 in Allen, 2007). It has a standard of comparison such as norm referenced and criterion-referenced. The informal assessment does not have the same criteria as the formal assessment. The reliability and validity of the instrument are low, and sometimes it is developed by teachers (Shepard, Taylor, & Kagan, 1996).

1.2.3 Context of assessment

The best way to assess young children is to observe their behaviour during their daily routine in the class, playground, and at home. The assessor could observe a child through informal interaction where the child is actively involved in a problem-solving situation in language, fine motor, and maths. It is not advisable to use paper and pencil with children because they learn through doing things. They do not have enough skill to show their actual skills in writing (Scott-Little & Niemeyer in 2001 in BUILD, 2005). The observers might use rating scales, checklists, portfolios or other methods.

1.2.4 Focus of the curriculum

Educators need to consider two important aspects. First, the curriculum, learning environment, and teaching need to be developmental, appropriate for the age of the child who will be receiving them. Second, they need to pay attention to the individual differences between the children in their planning (NAEYC, 1984).

1.2.5 Link between early childhood education and early intervention

Usually, the focus of the program of early childhood education is on the development of the children based on age. The early intervention is to provide the children whose development is not within the norm with an appropriate leaning experience in order to make progress in their development (NAEYC & NAECSSDE, 2003).

1.3 Background of education development in Bahrain

In Bahrain, informal education began in "Al Kuttab". The term "Al kuttab" comes from the past tense verb katab which means wrote. "Al kuttab" refers to a place, where children learnt "Quran", reading and writing. The children, who finish "Al kuttab", join the mosque for further professional study of Arabic language literature, and branches of Islamic studies. There is no record on the starting date of "Alkttab". Later, semiformal education was initiated by the "American mission school" in 1892. In 1919 the first formal school "Al Hidia Al Khalifiya" was opened. "Al-Hidia" means guidance and Al "khalifiya" is borrowed from "Al-khalifa" the name of the Royal Family in Bahrain. Evening classes at the literate club in Al Muharraq were opened due to a long waiting list to join the school. This reflects people awareness and desire to enrol their children in the school (Al Muraki, n. d). In 1931/1932, this school became under full supervision of the educational directorate. In 1945/1946 Ahmad Al Omran became the Director of Education (Al Muraki, n. d). Between 1921 and 1936, six schools were opened in Al-Manama, Al-Hed, Eastern Raffia, Sitra, Al-Budyia and Al-kamees. The first informal girls' school was opened in 1928 in Al-Muharraq. The name of the school was "Khadija Al kubra". "Khadija" is the name of the first wife of the prophet Mohamed peace upon him, and "Alkubra" means the biggest.

Today, public schools in Bahrain are under the umbrella of the Ministry of Education. The educational ladder is composed of preschool education, basic education, religious education, private education, special education, and non-formal education. The preschool education is optional. It consists of two parts: nursery aged 0-3 years, and kindergarten aged 3-6 years. The nurseries are under the supervision of the Ministry of Social Development; whereas the kindergartens are under the

umbrella of the Ministry of Education. The basic education is divided into primary, intermediate and secondary education.

The primary education consists of two rounds. The first round consists of grades 1, 2, and 3. The second round is composed of grades 4, 5, and 6. Most of the teachers in the first round are females, who have graduated from a B. Ed program called "Mualem Al Fasal". The B. Ed is provided by the College of Education at the University of Bahrain (Al Sulati, 1988; Janahi, 2002). The intermediate education is considered in the third round. It consists of three grades: 7, 8, and 9. Finally, the secondary education is composed of three grades: 10, 11 and 12, and it has several branches: Science, Literary, Commercial Technical, Textile, and Advertisement. These branches are changeable depending on the market needs.

1.3.1 Special education service in Bahrain

In Bahrain, some children with special education needs are provided with a support service. The Saudi-Bahraini Institute for Visual Impairment is the oldest centre. It was established in 1974 through the cooperation between the two kingdoms of Saudi Arabia and Bahrain. It accepts children with visual impairment from different countries with no fees. Today, some individuals with visual impairment hold university degrees. Another institute is the Al-Amal institute, initiated by The Child and Motherhood Society. This institute accepts children with moderate mental retardation, including Down syndrome. The children are registered in this institute based on their level of learning disabilities, and not their academic level. It does not accept children with more than one disability. It provides children aged 6-12 with an educational program, and children 12-15 years old with a vocational training program.

Children with hearing impairment have two choices. One is The Shakain Al Farisi centre for children with hearing impairment. It was initiated by a businessman from Kuwait called Shakain Al Farsi. The focus of the centre is on sign language, and it provides a full time service. The second choice is The Prince Sultan Ibn Abdulaziz Al Saud for Hearing and Speech Development. It is a charity institute which was built by the Saudi prince. It concentrates on auditory and verbal therapy. It provides children with a part time service. Some of the children who received this service

joined public schools. Another institute is The Society of Down syndrome. It has established a kindergarten that has implemented "Portage program". In addition, there are three centres for children with autism, Al Wafa, Al Rahma, Al Rashad Centre, and Alya centre. These centres are under the supervision of the Bahrain Society for Mental Retardation. Finally, there is Bahrain International Centre for Physical Disability. It launched a kindergarten as part of its activities.

One of the most popular centres is The Social Rehabilitation Centre. It is under the administration of the Ministry of Social Development. It provides children with a vocational and academic program. It aims to train children with mental retardation to be independent and functional in society. The centre contains four units. These are hearing defect, special education, vocational rehabilitation, and craftwork.

For the children with learning problems in mainstream, the Ministry of Education has a Special Education Department, which was opened in 1979/1980. Most of the special education teachers are teachers in the primary education or other stages who received a one year higher diploma, either in mental retardation or learning problems. The training is provided by The University of the Arabian Gulf located in Bahrain. Little information is published about the work of this department. From my interviews with some of the teachers, I knew that they begin to provide children with a support service at the beginning of the second term in grade 1. They use the class teacher evaluation of the children at the end of the first term. This evaluation is based on the competencies that the children must learn in grade 1 in reading, writing, and maths. I found that they use phonics in reading and they teach children in small groups. There is no special program that they follow.

This provides a short summary of the major disabilities, and special education centres that foster children in Bahrain.

1.4 Research problems

This part introduces the research problems. It consists of five parts. The first part is on young children's rights to receive appropriate education. The second part discusses the lack of database information on children with learning problems in Bahrain. The third part is on the importance of research funding. The fourth part is on

school entry and assessment procedures. The fifth part is on the negative coping strategies which some children might use.

1.4.1 Children's rights for appropriate education

Bahrain signed the Geneva Convention on the rights of the child in 2002. Based on that, the Ministry of Education is required by law to provide every child in the school an appropriate education. In Bahrain, like in any other country, there are some children with different types of disabilities, but there are a few problems. First is lack of published information on types of disabilities and the number of children. Second is lack of funding for research in special education. As a result, two problems arise. The first problem is a deficiency in the number of experts in the different fields of special education specialising in childhood assessment. The second problem is lack of appropriate assessment procedures to identify early childhood problems.

1.4.2 Lack of statistical data on the learning problems within the educational system

Provision of database information in any field is very important. The information organises the work. It describes the philosophy of the field, its objectives, the present situation, the problems that need to be solved, the financial support, the accomplishment in the field, appreciation of the people's effort, the plans for future improvement in the programs, and provision of the expertise. In Bahrain, after 20 years of starting the special education needs service in the Ministry of Education, there is no informal or formal information provided to researchers or the public about the special education service in the education system. There is no information about the types of the learning problems that the children experience in the public schools and the number of children with learning problems in each type. The curriculum of the special education service is not clear.

The Ministry of Education does not provide statistical data about the size of the problem perhaps to avoid criticism from the public. The situation could be interpreted as the Ministry of Education denying the presence of a problem in special education. I think recognition of the problem is the first step on the right path.

Sharing the information with others encourages researchers and other institutes to contribute to the development of the service.

1.4.3 Research funding

There is no information about the Kingdom of Bahrain budget for research. At the same time, there is no institute which provides funding for researchers. Funding is important for the development of the service in any field and in this case, childhood education. Funding assists in training of experts in different fields of early childhood education such as policy-making, curriculum planning, teaching, assessment and early intervention.

1.4.4 School enrolment and the assessment procedure

Literacy and numeracy are important tools for seeking knowledge. Children learn literacy and numeracy together before they join a kindergarten (Clay, 1979; Dyson, 1984). They acquire this knowledge through social interaction with parents and other family members at home. Prior to school entry, the children are expected to develop the primary skills which are required for formal instruction. They learn the foundations in literacy and numeracy through formal instruction in grade 1. In Bahrain, 6 years old children are registered in primary school during November of each year. These children join grade 1 in September of the following year. Parents are required to present the child's birth certificate and general medical check up from their local health centre. The school does not screen children for learning problems in literacy and numeracy in order to place the children with the learning problems under observation and provide them with appropriate support. The children who enter the school include the children with slow learning, mild, and moderate mental deficiency, language disorders, literacy, numeracy problems, and other problems. During the pupils stay in the first round in primary education, there must be some signs detected to indicate that some of them have problems in either literacy or numeracy. I am sure that experienced teachers could tell if a pupil has a problem. At the end of the first term of grade 1, some children are provided with a support service based on the teacher's evaluation of the child's performance on the competencies of grade 1. The competencies are based on the behavioural approach. Teacher

evaluation is not based on scientific research. Lack of an appropriate assessment procedure does not help to find the precise problem of the pupil.

According to the verification of articles 6 and 7 of the evaluation system in basic education, which was published in 1994 (appendix 1), it says the following:

- All children are transferred from grade 1 to grade 2 at the end of the annual year. The school has to determine the children who did not reach competency in Arabic language and maths so it can be followed up in grade 2.
- In special cases, if the teacher observed that the child did not reach competency in most of the main competencies in Arabic language and maths and she thinks it is better if the child stays in the same class for another year, the school administration forms a committee of the school administrator, special needs teacher, class teacher, senior teacher, and social worker in order to study each case separately. If the committee decides that the child must stay in grade 1, the administration must have the child's parent's approval in writing.
- All children who reach the main competencies in Arabic language and maths must be transferred from grade 1 to grade 2. The school administration forms a committee of the administrator, special needs teacher, class teacher, senior teacher and social worker in order to study the cases of children who did not reach the competency in most of the competencies in these two subjects and have delayed. The committee takes the decision as whether these children stay in grade 1 or are transferred to grade 2. In both cases the school constructs a program for each child under the supervision of both the directorate of primary education and curricula.
- It is possible that the child repeats grade 2 once only, and then is transferred to grade 3. The school constructs a program for each child under the supervision of both the directorate of primary education and curricula.

It shows that the system is segregating children into good achievers and poor achievers. Little attention is provided to a child as a human and his development. The system does not focus on the pupil's problem in order to help him. There are three problems here. The first is that the evaluation and the assessment system do not have

sections for children with special needs. Second, the present qualifications of the teachers do not provide the teachers with the skills to manage the children's learning and they lack knowledge of children with learning problems. The teachers are engaged with other responsibilities in the school that take up their valuable time which is required by the children. The Ministry of Education does not have experts in childhood assessment and procedures to assess children with learning problems. Lack of experts and assessment tools means children with learning problems are not provided with an appropriate curriculum or intervention program at an early stage. Importing an instrument from other Arabic or non-Arabic context is not a solution for this problem due to cultural and contextual differences. The main aim of this research is to develop an instrument to identify young children's reading, writing and numeracy problems in context of Bahrain

1.4.5 Coping strategies

Some children, who do not do well in the school, and who do not receive an appropriate support service, develop coping strategies. The main observed strategy is that they withdraw from school when they are placed with younger children when they reach intermediate level. Coping strategies bring an internal comfort to the children and protect their self-esteem. Children's usage of coping strategies has a negative impact on their achievements. Using these strategies is wasting time, effort, and budgets spent on the educational process. The presence of these strategies does not agree with the Kingdom of Bahrain's effort in sustainable human development and quality of education.

During my reading, I found a few research articles on the coping strategies that children use while they are working on an academic task. I think research in this area is very important. I want to investigate the coping strategies children use at an early stage, before they decide to withdraw from school.

1.5 Personal observation and interest

In Bahrain, I worked with preschool children aged 3-6 years for 14 years and I used a one to one program for children with learning problems. I observed two issues. First,

some young children in the kindergarten and primary school had difficulties, when they worked on academic tasks. For instance, I saw children:

- Could not hold a pencil in a correct way. They had unreadable handwriting, and the size of the letters was not the same.
- Could not read a task that is suitable for their age group. They hesitated to begin reading. They were confused between the name of the letters, and their sounds or had speech problems.
- Had difficulties differentiating letters that have similar shapes.
- Had problems with counting

The other issue is that I saw at least two girls who were struggling at their teens with learning problems at school. One of them was in grade 6 during 2004. She could not read and write. During the exam, the special education teacher read the questions to her so she could answer them orally. The second girl was in the intermediate stage during 2008. She is very weak and she is the eldest in her class. When her mother talked to the school principal about her daughter's condition, the principal told her that this is the girl's limits, and the school cannot provide her with further support. The mother decided to withdraw her daughter from the school, and let her stay at home. Both the school principal and the mother took the decision on behalf of this girl without discussing the matter with her. As other children, this girl has the right to attend the school, experience success, and plan for her future. These are just two examples of children with learning problems in the school. Assessing the children at an early stage could provide them with an alternative such as focusing on their hobbies for a future career.

1.6 Outline of the thesis

The rest of the thesis is organised as follows:

Chapter 2: Literature review.

The chapter contains basic knowledge on the development of reading, writing and numeracy. It includes a discussion on some items that are important in reading, writing and numeracy. It contains a summary on coping strategies. I describe the gap in present knowledge in assessment areas in Bahrain and children's use of coping

strategies when they work on academic tasks in a national and international context. I listed my research questions.

Chapter 3: Research method

In this chapter I describe in detail the method that I used to do this research. I explain the sample selection, development of the test, interviews, coding and scoring procedures.

Chapter 4: Results (1)

The focus of this chapter is on the quantitative analysis of the data. Mainly, I discuss the reliability and the validity of the test. I use an additive risk model to predict the factors that might cause future learning problems in reading, writing and numeracy. I used construct validity to identify some items that distinguish the children with learning problems. I discuss the performance of the children on the test and in the school. I found the subtests which predict future learning problems in reading, writing and numeracy. I try to identify the most appropriate timing for the test application.

Chapter 5: Results (2)

This chapter contains the qualitative analysis of the data. The main focus is on the coping strategies that some children with learning problems use on academic tasks. I explain the classification that I developed for these coping strategies. The second part of the chapter is observational comments on the performances of some children during the test. I present some drawings from children such as a human figure drawing, writing own name, writing a letter, and copying shapes to describe their developmental stage. I provide examples of the typically developed children's procedure in copying the diamond shape. I discuss the relationship between the children's performances on the tasks in the school and their use of coping strategies.

Chapter 6: Discussion

This chapter discusses the main findings of the research. The first part is on the test reliability, validity and the test implications. The second part is on reading. It includes phonological awareness, phonemic awareness, concepts of print and implications. The third part is on writing. It includes writing one's own name, drawing a human figure, writing a personal letter, coping shapes and implications. The fourth part is on numeracy and its implications. The fifth part is on coping

strategies. It includes the children use of the coping strategies and circumstances in both the school and during the assessment. This section contains the implications too. The sixth part is on the children's performances on the test and the timing of the test. The final part is on the limitations of the research.

Chapter 7: Conclusion

2 Literature review

2.1 Introduction

Literacy and numeracy are important for school entry. Young children, in order to learn, need to be emotionally comfortable. They need to work on academic task appropriate to their level of performance. Therefore, it is important that we have screening and diagnostic instruments in order to help them. These tests are required to be related to child development and the school curriculum. This chapter consists of three main parts. The first part discusses the assessment process in education settings. The second part provides a discussion on school curriculum and curriculum based assessment. The third part is on literacy and numeracy. The fourth part is on children and coping. The final part is on previous research and the study research questions.

2.2 Assessment

The process of assessment involves three stages. These are screening, diagnosis and decision making on planning instruction or intervention (Thorndike, 1997).

2.2.1 Screening

Screening in general refers to a "quick survey to locate individuals who may need or may be eligible for special treatment .... A closer case study follows the screening" (Cronbach, 1984:21). Salvia and Ysseldyke (1985: 14) described screening in educational context as identifying: "students who are sufficiently different from their age-mates that they require special education" (Marston & Magnusson, 1985). In other words, it is a quick procedure to identify children who require special support. In a screening assessment, each child is assessed in relation to his peers with similar experience (normative) or in relation to a standard or criterion of performance (criterion reference). For instance, if a screening test is used for reading achievement the outcome of the screening is a cut-off score to separate children who have problems in reading from children with no problems in reading. The details of the problems are not required at this stage. Screening tests are commonly used in primary school, often to support placements. In general, the focus of such screening tests is on basic skills in social behaviour, speech, language, early literacy and numeracy

(Howell & Nolet, 1999 in Scott, Hintze & Floyed, 2008). An example of a screening test is baseline assessment in Britain. Children generally need to take such a test at the beginning of their primary education (Lindsay & Desforges, 1999). The class teacher could conduct the screening which could involve a standardized construct curriculum based measurement (CBM). Details about this will be discussed under curriculum-based assessment.

A screening test which is used for "universal" screening purposes, and is administered to a class group consisting of those with difficulties and those who are typically developing should be a reliable and accurate predictor of the skill which it measures. Screening tests are evaluated on classification accuracy, and efficiency. Classification accuracy is the most important feature of a universal screening test. In the case of a test for learning, it is the ability of the test to differentiate, and identify children at risk of low achievement, and those at no risk of low achievement. A good screening test is judged by its sensitivity, the ability to identify children truly at risk of failure, and specificity which is its ability to identify children truly not at risk of failure. The best screening test has both its sensitivity and specificity around 80% (Jenkins Hudson, & Johnson, 2007).

The universal screening tests could be used for different purposes. First, data at grade level from several districts can be compared to national norm to identify if students in a district are making enough progress in relation to other districts with similar demographics. The districts which do not show appropriate growth need to modify or change their curriculums. Second, the universal screening test can be used to compare the achievement of the schools within a district. The schools with lower attainment need to revise their curriculums and instructions. Third, the universal screening test can be used to identify children who do not progress in the general education, and they need intervention. The screening test is useful for group instructions. It is also the first step for in depth-assessment called diagnostic assessment (Hosp & Ardoin, 2008). Third, the universal screening test can also be re-administered in order to monitor progress. Such tests should be quick and efficient in administering, and scoring, and capable of administration by teachers or any other support staff in the school (Hosp & Ardoin, 2008).

After screening the children, the class teacher keeps the students who were identified as having problems under her observation. She monitors their progress on formative tests. These are short tests which can be given to students after finishing a unit to make sure that they reached mastery of the planned objectives (Gronland & Waugh, 2009; Gipps & Stobert, 1993).

Scott, et al (2008) reported that the National Center for Education Statistics conducted a longitudinal study on 10.500 children from kindergarten to third grade during 1998 to 2002. The aim was to investigate factors which put children at risk of mathematics problems. They used a standardized measure of number sense operation and geometry. They found that children with low achievements in third grade started kindergarten with fewer entry skills. Griffitin, Case and Siegler (1994) found similar results. They indicated that differences in childrens' experiences in number skills are less apparent in kindergarten entry. However, they become more observable with time.

2.2.2 Diagnosis

Diagnosis is the next step after screening. Sometimes the teacher's judgment is enough in order to refer children for diagnosis. It seems that diagnostic assessment was first used in the area of learning disabilities close to medicine. The children who were identified with learning problems in the screening test will be monitored and observed by their class teachers for a while. If they still have problems, and have little progress they may bev referred to a school psychologist or specialist for more comprehensive assessment called diagnostic test. Diagnosis includes tests to identify childrens' strengths and weaknesses. It provides possible causes or reasons for low performance or inappropriate behaviour. (Nitko & Brookhart, 2007; Cronbach, 1990) Usually, diagnosis is conducted by aneducational psychologist or other specialist.

Nitko (1989) identified a few categories of diagnostic assessment. The most common category is mastery of behavioural objectives. The deficit is defined as a failure to master one or more instruction objectives. The meaning of mastery/non-mastery and remedial procedure depends on the connection between the purpose of instruction, the stated objective, and the items developed for the test. The main focus is on the consistency of response. Sometimes the statement of the objective is not clear.

Second is error analysis which makes more focus on the pattern of error in the child performance. The emphasis is on the content of items. It can be conducted in one to one interview or group (Wood, 1991).

Gipps et al (1983) found that teachers depend on their own judgments and observations instead of diagnostic test results in order to assess children. They added that most of the times the results are kept in the child's records only. Similar findings were found in the U.S (Salmon-Cox, 1981; Yeh, 1978) and Ireland (Kellaghan, et al, 1982). Examples of diagnostic tests are Young's Group Reading Test by LEA's and Schonell Grade Word Reading Test by school.

2.2.3 Planning for instruction

Based on the results of the diagnostic test or tests, the class teacher needs to make decisions on what to teach the child, and how to teach it. She needs to decide if the child lacks prerequisite skills for the tasks he needs to learn, or has a problem in acquiring the skills, fluency or generalizing. Furthermore, the class teacher needs to think about appropriate ways to motivate the child in order to learn. To accomplish that, she has to do some modification in the curriculum and materials to adapt them to the child's needs (Hosp & Ardoin 2008).

2.3 School curriculum and Curriculum based assessment

This part consists of three main sections. The first section is on the normative nature of the school curriculum. The second section is on curriculum-based assessment. The third section is on preschool and primary school assessment in Bahrain.

2.3.1 The nature of the school curriculum

The school curriculum is arranged in a gradual manner. Each stage of instruction depends on what was taught in the previous stage. It provides a means of monitoring the progress of a student from one grade to another. The curriculum of the school contains the following characteristics (Gickling & Thompson, 1985):

1. The school curriculum is written at grade level. It is divided into a series of grade levels based upon the achievement levels of average students in a population.

2. The developmental curriculum is constructed in a progressive manner that requires certain content to be delivered year by year. It means a plan should be made for the amount of the materials to be taught per day and week. Teachers are required to cover a certain quantity of materials at broadly the same speed in a classroom full of students to keep up with the developmental pace of the materials.
3. Each grade materials begin from the ending point of the previous grade materials. Based on the developmental plan, it is assumed that all the students receive sets of skills. This assumption is confusing because it does not consider the child's skills, and quality of instruction, teaching aids and how easy the materials are for the students.
4. A printed developmental curriculum may be difficult to modify. The materials and their requirements may be imposed on all students without considering weaknesses in some. The students are expected to adapt to the curriculum which may place a great pressure on some students. It could lead to undesirable behaviour and failure (Gickling & Thompson, 1985)
5. A developmental curriculum is constructed to deliver knowledge at a grade level. This type of curriculum may pay less attention to the need of other students within the population such as students who are below or above average or who need special educational/additional support needs (Gickling & Thompson, 1985).
6. The function of such a curriculum is to discriminate between students based on their success and failure. It allows students to identify which of their peers are experiencing problems. Here the curriculum controls the student's learning. It is expected that teachers make some modification in the tasks to match each student's needs (Gickling & Thompson, 1985).
7. It is natural that students come across a few tasks they do not understand or score low in work or do not receive enough attention from teachers. Some students encounter mainly negative academic experiences, and they have only a few positive experiences in the regular classroom. It is possible that they do not have pre-requisite skills, but the school system expects them to continue in the developmental curriculum at the same pace as others from

the same age, and make similar progress under the same conditions of instruction practice. The pupils find it difficult to adjust to the pace, and load of the curriculum. These students fall behind their peers, and experience failure after failure as a result of grade level features of the curriculum (Gickling & Havertape, 1981). These children's skill levels or learning rate do not match the instructional entry skill requirements, and rate of the grade level program (Haegis, 1982 in Gickling & Thompson, 1985). These children did not master the requirements of the previous materials, and they received new materials. They are expected to work similar to the pace of average children. Often, the teacher's judgment is that the problem is within the child. Teaching and previous learning may be considered as a cause for failure. If a child has certain skills and he does not receive support, this leads to an accumulation of difficulties, and he will be judged on the deficiency of prerequisite skills. These causalities of the curriculum would not reach this stage if their teachers had modified the curriculum to meet their needs instead of forcing them to success in the current structured curriculum (Hargis, 1982).

2.3.2 Curriculum-based assessment (CBA)

This section consists of six parts. First, I explain the concept of curriculum based assessment. Second, I discuss the learning objective approach which is the theoretical basis for CBA. Third, I introduce the Instructional Delivery Model for Kickling. Fourth, I discuss curriculum-based measurement. Fifth, I explain how CBA and CBM can be used as screening tests. Lastly, I state some strengths and weaknesses of CBA.

CBA is an assessment model derived from the curriculum (Gickling & Harvertape, 1981). CBA is formed of procedures of direct observation and recording a child performance within the school curriculum. CBA contains short timed and repeated measures developed from the curriculum which can be used frequently. CBA emphasis is on the way of collecting data, interpreting, and using the data to modify the instruction. The gathered data is used to make decisions about the instruction. It is used to select suitable instruction materials and the intervention program. CBA is

associated with what has been taught in the class (Burns, MacQuarrie, Campbell, 1999 in Burns, Dean, Klar, 2009).

CBA was first introduced by Gickling in 1977. The primary goal of CBA is to reduce the mismatch in the instruction between the skills of students with low achievement and other students in the general class. CBA focuses on three points. The first point is entry skills. The skills a pupil brings to school. The second point is the demands of the curriculum or the task to be learned. The third point is the future curriculum and instructions. CBA provides a direct connection between teaching instruction and assessment (Gickling & Thompson, 1985).

CBA is based on three themes. The first theme is that the curriculum is a basic and meaningful basis for assessment. McLoughlin and Lewis (1981) indicated that test developers need to use the curriculum as a source for instructional decisions. The second theme is that the curriculum places explicit demands upon the child. The third theme is that the curriculum needs to be modified for academic success (Gickling & Thompson, 1985).

2.3.2.1 Learning objective approach (behavioural approach)

Curriculum based assessment is derived from the learning objective or behavioral approach. The focus in this approach is on the factor that can be controlled in order to help a learner to experience success, and to avoid experiencing failure and frustration. These factors are related to the class teacher's behaviour and the classroom setting. It is not enough that the class teacher be qualified in her subject. She needs to develop a close rapport with her pupils. She is required to be patient and understand the pupil struggle. She also must have commitment. On the other hand, the class teacher needs to provide pupils with a stimulating class environment. It is important that the classroom contains enough materials and is organized in a way to facilitate the process of learning.

For instance, the class teacher of grade one needs to observe the pupils or do a quick screening test in the beginning of the year in order to decide the starting point for each pupil. This step is very important because teaching a pupil what he has already learnt or very difficult tasks create frustration and might cause problem behaviour. She needs to provide the pupil with challenging experiences appropriate to his level.

It is recommended to begin teaching one or two objective below his level on the existing competency. It allows the pupil to progress with success from one-step to another. When the pupil experiences difficulties, the teacher needs to analyze the task in order to find the missing skills which are needed to do the task. This procedure helps the teacher to draw the baseline of what he can do, and set up future objectives. Based on that, she develops her teaching main goals. For instance, teaching children concepts of numbers. Then, she sets her written objectives. The objectives are the end product of teaching. The objective must be a clear statement of what the teacher expects the pupil to do after teaching. It should contain an observable action such as read, say, write, copy, draw count, jump and point, but not know, think, and comprehend. For instance, the pupil counts counters within the range of 1-9 can one of the objectives for the previous goal (Ainscow & Tweddle, 1979). Mager (1962) suggested three components for an objective. These are:

1. Behaviour (e.g. sort and copy)
2. Conditions such as using coloured counters or cards, orally, shapes
3. Standard such as how many times or time limit

It is important that the objectives are in the right sequence and that there are no missing skills (Mager, 1975).

Ainscow and Tweddle (1979) argued that setting written objectives is important for teacher effectiveness especially in primary and special schools. It increases the probability of reaching goals, and helps teachers to be organized in their work. They added that setting objectives distinguishes between learning and teaching. It assures the teacher that what she taught is learnt. It has a positive impact on selecting appropriate teaching methods and materials.

Before teaching, the teacher needs to identify what the pupil can do, and what is needed to be taught. Then, she sets a programmed objective for him. When she plans an objective for a pupil she is required to make it appropriate for the level of the pupil, ensure that the pupil will experience a high level of success, and it provides the pupil a moderate level of challenge.

The following are the procedures used in the objective approach:

2.3.2.1.1 Procedures in the objective approach

There are three main procedures which are used in the objective approach. These are task analysis, precision teaching and model of skill acquisition.

2.3.2.1.1.1 Task analysis

The teacher needs to analyses the task which she is planning to introduce to the pupil. Task analysis consists of 3 components. First is to describe the task. Second is to identify the component skills in sequence. Third is to slice the task into small steps which can be managed by the pupil. Lister and Cameran (1986) suggested a sequential procedure for using task analysis. These are:

1. Increase the complexity of instruction provided to the pupil (chaining).
2. Reduce the amount of assistance the teacher provides the pupil during the task (fading).
3. Increase the number of skills the teacher wants the pupil to do in the task.
4. Reduce the number of cues provided by the teaching materials (shaping).
5. Expand the step size between objectives (slicing).
6. Reduce the time permitted to finish the task (fluency)

2.3.2.1.1.2 Precision teaching

Precision teaching is a procedure to record the pupil's progress on a daily basis. It determines task objectives which the pupil has learnt, and places them in the curriculum; it also provides the pupil with feedback on his performance. The focus of this procedure is on what should be taught rather than how to teach. Precision teaching is composed of 8 steps:

1. Select an area of difficulty.
2. Conduct a diagnostic assessment of the problem.
3. Sample performance-using prob.
4. Assess performance for 3 consecutive days.
5. Make decision on level of mastery.
6. Decide the length of the program.
7. Record results on precision teaching graph on a daily basis.

8. Program completed when mastery criterion reached for consecutive days (Mercer & Mercer, 1985)

The focus of precision teaching is on the first three steps especially fluency. Its aim is to improve the rate of learning.

2.3.2.1.1.3 Model of skill acquisition

Haring and Eaton (1978) suggested a model for skill acquisition. In the acquisition stage, the focus is on learning the skill or the task. Next, the emphasis is on the pace of the pupil in doing the task. Then it is to assist the pupil to develop a habit in doing the task. It is to make sure that the pupil could do the task any time he is asked. In the generalization stage, the pupil is able to use the skill in similar situations. In adaptation, the pupil develops the skill to modify the learnt skill in order to use it when it is appropriate (Ainscow & Tweddle, 1979; Hosp & Ardoin, 2009; Dagmar, (1981).

2.3.2.2 Instructional Delivery Model

Gickling (1977) developed an instructional delivery model which provides a student continous success while he is working on a task. Its focus is to control the degree of instructional difficulty by offering an intervention on a task-by-task basis rather than previous functional or grade level; it also places emphasis on the product of effective teaching more than the process of learning itself.

Based on the model, a task is evaluated based on 3 key components. These are:

1. **Type of the task**

   Instructional task is divided into "Reading" and "Drill". Reading is to acquire meaning from print. An example is reading a story for meaning. Drill consists of all computational tasks, study questions, spelling and writing, phonics, word attack procedures and sight word recognition. Drill is the stage of application of new knowledge. It is an essential part of reading, and it is required for mastery of other tasks. Reading and Drill were selected in the model because the teachers focus is on these two skills in their teaching, and the required percentage of success on the two (Gickling & Thompson, 1985).

2. **Task items**

Teaching is a ratio problem or it is the ratio of what is known to task difficulty (challenging items). A Known item is an immediate and correct response whereas challenging item is either unknown or response with hesitation. Observation could draw a line between the two responses (Gickling & Thompson, 1985).

3. **Performance level**

The ratio of known / unknown can be interpreted as instructional, independent and frustrational levels. In reading, the instructional ratio is between 93-97 % known items with 3-7 % challenge. Comprehension is 75%. In drill, the instructional ratio is 70-85% and challenge is 15-30%. The ranges provide flexibility in selection of instruction in the activities for reading and drill. It provides convenient criteria to evaluate how appropriate is the instructional task for the student on a daily basis. Independent level refers to the task that contains more than 90% known items for drill activity and more than 97% known items for reading. The frustration level refers to a task which contains fewer than 70% known items for Drill and fewer than 90% known items for Reading. Gickling indicated that a student receives most benefit if the materials of a learning task are on his instructional level. It means the student is familiar with the items in the tasks, and they provide him appropriate challenging levels in order to ensure learning and success (Gickling & Thompson, 1985).

The fundamental issue in using this CBA model strategy is to identify task difficulty, and control it all through the curricular activities to fit with the pupil needs. It requires evaluation of each activity and modification using known to challenging ratio in order to make it suitable for the pupil. This ratio might represent the entry requirements for a new task.

Denham & Lieberman (1980) developed a concept called academic learning time (ALT). It is defined as" the amount of time a student spends in relative content that

he or she can perform with high success" (Gickling & Thompson, 1985:8). The ALT is used to measure student performance within CBA conditions. The focus is on the student level of performance on each task every day (high, average or low ALT). An observational tool was developed to measure the student ALT level. The tool provides measurement of the student performance on 3 behavioural areas. These are on-task, task completion, and task comprehension. On-task score refers to the percentage of time the student spends working on the task. It is calculated by recording 20 seconds observations per minute for a sum of 20 observations. In task completion, completion scores are obtained by counting the number of items which the student tries to solve (both correct and incorrect) in each task. The purpose is to determine the number of trials over the total number of responses needed per week. In task comprehension, comprehension scores were obtained by the sample of items correctly identified or done and or understood in each task. It is obtained by asking the student some questions on the task (Thompson, Gickling, & Havertape, 1983 in Gickling & Thompson, 1985).

Gickling and Armstrong (1978) conducted a study on low achievers from grades one and two. The aim was to explore the effect of changing of the three levels of instruction (frustrational, instructional, and independent) on the performance of the students. CBA was considered as an independent and direct observation (ALT) as dependent variable. The pupils received one hour of teaching in 21 sessions for 7 weeks. The teaching took place three times a week. During the first six sessions, data were collected in order to determine the student's baseline level of performance. It included the three levels of ALT. The rest of the sessions were divided equally to collect information on frustrational, instructional, and independent level.

The ratio of known to challenge of the items was considered for each level. It was found that the pupils did not do well in both baseline level and frustration level, but they attained very highly in instructional level. A correlation was found between learning and instructional difficulties. Changes in the assignments difficulty level resulted in changes in the percentage of task completion, comprehension, and on-task behaviour. High ALT level was maintained only in the instructional level. In the independent level, task completion and comprehension were high, but on-task

behaviour was relatively low. Gickling & Thompson, (1985) concluded that selection of appropriate curriculum on a daily basis acts as antecedents for long-term achievement. At the same time, it shows that success on a daily basis (high ALT) acts an antecedent for appropriate classroom behaviour, but the opposite is not true.

2.3.2.3 Curriculum-based measurement (CBM)

Curriculum based measurement is a type of CBA. It is a collection of standardized and specific tests to measure the student performance on basic academic skills in reading, spelling, maths, computation and writing. The emphasis of CBM is on broad long-term goal objectives instead of mastery of short-term objectives as in CBA. An example is end of the year outcomes. The assessment is developed for the entire year based on the grade objectives. In this case, the performance is assessed continuously. It differs from mastery or criterion referenced models which required changing in the assessment materials to accompany the change in the short-term objective. CBM is useful in the assessment of maintain and generalization of what is learnt or the behaviour because its focus is on long-term objectives. The scores of CBM represent the performance on the current instruction and also the past and future instructional objectives. CBM contains precise procedures for assessment which includes methods for generating tests stimuli, administering, scoring the test and a summary derived from the data. Use of standardized tests in CBM permits comparison among students; also it allows comparing a student performance in different times (Hintze, et al., 2006).

CBM includes a number of standardized and valid tests to assess a student performance in the basic academic skills. For instance in reading, a student is asked to read aloud a graded passage for 1 minute, his score is based on the number of words read correctly. CBM might sound similar to CBA in using this passage, but its aim is to measure fluency which includes accuracy and speed. CBM tools are dynamic. They measure short-term effect of the instruction and the change over time. They provide a clear picture of the student performance in an academic area (Hintze, et al., 2006).

CBM in reading consists of three main features. First is the development of test materials or reading probes. Second, is administering and scoring of the reading

probes. Third, analyzing the data and making a decision. This plan can be used in both survey level assessment and monitor progress overtime. In survey level assessment, summative assessment is used to assess the student skills in reading using reading passages with different levels of difficulties. The goal of the examiner is to determine what has been mastered, frustrational, instructional, and independent level. Three reading passages for one minute are used to serve this purpose (Shapiro, 2004 in Hintze, et al., 2006).

Then, the formative assessment is used to monitor the student progress in reading over time. At this stage, reading materials with consistent levels of difficulty are selected from the long-term objectives materials (Hintze, et al., 2006). The student is asked to read a passage for one minute, and the examiner notes the mistakes. Then, the examiner calculates the number of words read correctly per minute. The examiner does the same with the other two reading passages. At the end, he calculates the median for the number of words read correctly in the three passages. Then, he uses the instructional placement standards (Shapiro, 2004) to find out if the student skills in reading at that grade level at mastery level, instructional or frustrational level. After that the examiner moves up and down grade levels until he determines the three placement standard levels. Next, he determines the highest reading level of the student at an instructional rate. The teacher begins setting goals and instruction from this point. In the progress monitoring stage, the examiner uses the same procedure as in the survey level except in this case, he uses 20-30 reading passages and each session includes only one reading probe/ 1 minute. The examiner monitors the student progress twice a week for a period of 10-15 weeks. Then, he plots a graph using the collected data. He observes the growth in the student's level of reading over time. Then he makes a decision on the following steps (Hintze, et al., 2006).

2.3.2.4 Use of both CBA and CBM as screening tests

Both CBA and CBM could be used to underpin universal screening tests in the beginning of the years in all grades. An example is SEEP for Witt, Daly & Noell (2000 in VanDerHeyden & Burns, (2005) and the test used by Scott et al (2008). It is used for all students in the school in order to identify their problems in reading,

writing and math or placement in the beginning of the year. For instance, 3 CBA probes can be administered in any area for 5 minutes only.

Scott et al (2008) used a curriculum based assessment approach to develop a short duration assessment measure to be used as a screening test for early numeracy. The sample consisted of 64 American kindergarten children from the rural Northeast. The duration of the study was 26 weeks. They used Test of Early Mathematics Achievement (TEMA-3) for Gisburg and Baroody (2003) because the authors of the test are engaged in development of instruction, assessment and curriculum. The test contains measures of number skill, number comparison, recognition and writing number, number concepts and calculations. Teacher rating of children's performance was used, and the test's application was observed. They used internal consistency (range 0.53-0.83) and test retest (0.68-0.98) for reliability. The sensitivity and specificity is in the range of 0.70-0.88. Scott et al concluded that Early Numeracy Skill Indicators tasks are reliable and valid. It can be used for screening purpose. They made emphasis on the importance of development of measures to prevent failure, and improve maths competency.

If we consider the definition of screening test (Salvia & Ysseldyke, 1995) it seems that the survey stage in CBM can be used as a screening test to identify children with special needs in the beginning of grade one or and grade 2 and 3 too (Marston, Mirkin, & Deno 1984 in Marston & Magnusson, 1985; McGlinchey & Hixson, 2004). Then, the student's progress will be monitored using CBM. The data from both procedures will be used to make a decision about instructions for all the students. This process is cheap, and does not take a long time. It also can be repeated several times during the year to identify the students whose achievement is below their level of performance and those with a low rate of progress. During the intervention, CBA is used in teaching the missing skills and the child's progress will be monitored. Lastly, the program will be evaluated using CBM again to find how effective it was for the child. This can be done by measuring the extent of improvement (Marston & Magnusson, 1985; Ainscow & Tweddle, 1979).

2.3.2.5 Strengths and weaknesses of CBA

There are several strengths in CBA. First, it can be seen what the child attained very clearly. Second, it allows no doubt about the learning. It identifies what the child can do or cannot do. Third, the child'slearning can be measured. Fourth, CBA is precise in identifying the gap in the child's learning or locating the exact difficulties. Fifth, it assists the teacher to locate appropriate teaching materials and activities. Sixth, the amount of time the learner uses to work on the task is used effectively so that he can work with success. The focus is on the quality rather than the quantity. Academic learning time is viewed as another way of measuring on task behavior (Harker & Mcphayan, 2009).

On the other hand, there are some weaknesses in CBA. First, it does not investigate if the learner understood the task. Second, it suggests a hierarchical form of learning and the learning occurs in step by step. Third, it is time consuming. It involves a lot of recordings and paper work. Fourth, it is very content and focuses on narrow areas of learning. Fifth, it focuses on marginal aims. Sixth, it focuses on the product of learning instead of the process. Seventh, the learner is perceived as a passive learner rather than active participant. Eighth, It does not consider cognitive skills, meta cognitive skills, social and emotional factors and environmental factors. Ninth, it does not pay attention to formative function of assessment, but the emphasis is on summative form. Last, CBA does not deal with the cause of the problem (Harker & Mcphayan, 2009; Ainscow & Tweddle, 1979).

2.3.3 Curriculum and assessment at preschool in Bahraini (5-6 years old)

In Bahrain, there is no formal curriculum in the preschool level, and there are no competencies. Each preschool has its own curriculum. Also, there is no formal assessment in the preschool. The teacher uses direct observations, and the child's portfolio to assess the children. She monitors children's food habits. She encourages them to eat healthy food. She makes sure that the children eat their food, and she shares this information with mothers. The teacher also monitors the children's health. She checks if the children are sick or have a fever. She lets the principal know about that, and contacts the child's mother if necessary. Also, the teacher monitors the

children's movements in the class, and in the playground. She checks their hearing and vision during the activities. If she has any suspicion she contacts the principal. Furthermore, the teacher assesses the children's behaviours and academic performance. She focuses on what the children can do and cannot do. The teacher has a logbook which she uses to note down her observations of children's behaviours. This is done on a daily basis. She writes down appropriate and inappropriate behaviours. On some occasions, she needs to call the parent and discuss with her if it is harmful. If it is not urgent she leaves it for the open day. Usually, she discusses inappropriate behaviour with the principal in order to find an appropriate way to deal with it. In most cases, she uses time out. A chair placed in one corner is used for time out. The children are familiar with this practice in advance. It is used as part of classroom management. Positive behaviour is rewarded immediately.

Direct observation is also used in academic areas. The teacher writes down some answers for the following:

1. Does the child talk in the class?
2. Does he have a problem in speech?
3. Does the child interact with other children?
4. Does he participate in the class?
5. Does he memorize some rhymes?
6. Does he know the letters, numbers and shapes?
7. Is there an improvement in any area?
8. Does he need help in some areas?

The teacher needs to write a report about each child, and to give it to his parents on the open day. The open day is once every three months. The report is based on different areas of the curriculum. She needs to tick and write some comments. She uses her observations, and the portfolio to complete this report. The teacher extracts from the child's portfolio some information about the fine motor coordination (colouring, painting, copying and writing). She could observe if there is fast, slow improvement or difficulties in holding the pencil. Sometimes, the teacher observes a sudden change in the colours the child uses in his painting. For instance, a child uses bright colours, but on a few occasions he just does some black scribbles only. She needs to be careful, and discuss this issue with the parent. It is possible that

something undesirable is happening at home. In alphabet, she writes whether the child could recognize the taught letters, writes them, and learn some objects which begin with the same sound of the letter. In numbers, she writes in the report if the child could count some objects in front of him within the range of ten or more. She writes comments on his identifying of the symbols and writing them down.

2.3.4 Competencies and Assessment in grade 1 (6-7 years)

The features of the primary education in Bahrain are similar to the features of the curriculum introduced earlier in this chapter and are based upon key competencies. The following are the competencies of Arabic language and mathematics for grade one in Bahrain.

Table 2-1 Competencies of reading in Arabic language for grade 1

Area	Main competencies	Sub-competencies
Listening (Comprehension)	1. Understands and comprehends various contents that (he listens to) are adequate to his level for 3 minutes.	• Listens attentively. • Responds to three steps guidance and instructions that are provided by others in different situations. • Predicts content of text that he is listening to from its title or introduction. • Determines the main idea in the text. • Answers appropriately questions about characters, events or things based on listened text. • Determines the main idea in the text. • Answers appropriately questions about characters, events or things based on listened text.
Talking	2. Talks spontaneously and easily using at least four complete and accurate sentences in different situations:	• Speaks with courtesy, politeness and social propriety in various situations. • Talks with appropriate and clear pronunciation of words and phrases. • Applies acquired linguistics terms appropriately in his talk. • Expresses himself orally clearly about his experience and needs in different situations. • Asks and answer questions with confidence in different situations he listened to or read from stories or information as it is mentioned. • Describes events, characters, or things using clear language. • Gives oral guidance and instruction to his peers in different situations. • Performs simple role-play in Drama or play expressively.

Reading	3. Capable of using literacy (utterance) skills required for learning to read.	• Identifies sounds and shapes of letters: 1. Says or pronounces the sound of a letter with its diacritical marker correctly. 2. Says or pronounces sounds of letters with vowels correctly. 3. Says or pronounces silent and emphatic letters attached to other letters correctly 4. Connects between letter shape and its sound. 5. Differentiates letters that have similar shapes and sounds. • Uses the sound of the letters to 1. Analyze Sentences into words -Words into letters. 2. Synthesises (blend) sounds of words into sentences, and sounds of letters into words.
	4. Reads aloud a round of 10 sentences adequate to his level accurately	• Reads aloud with fluency acquired sentences or words and pays attention to: 1. Pronounce words in sentences correctly. 2. Assimilate meaning. • Reads aloud current learned sentences correctly using his previous experience • Sings short rhymes correctly.
	5. Comprehends meaning from short text suitable for his level and containing around 10 sentences.	Strategies for text comprehension: • Recognizes pre-reading strategies from pictures or title. Based on his previous experience he predicts content of text. • During reading he recognizes text analysis strategy: 1. Identifies clue words in reading text. 2. Recognises the meaning of new vocabulary in the text. 3. Recognises the main idea in the text. 4. Answers questions related to events and main characters in the reading text. 5. Re-arranges ideas and events in sequence based on their order in the reading text. 6. Prediction with real text content. • Recognises post reading strategy: 1. Generates one question or more around the reading text. 2. Contributes with his views on reading text. • Recognises vocabulary development strategy: 1. Recognises the meaning of terms through synonymy and antagonism. 2. Recognises basic instruction for using a

		dictionary. 3. Arranges words in alphabetical sequence based on the first letter.
	6. Uses some simple study and research skills (communicate and have access to library).	• Uses some of main resources such as newspaper, book, children magazine, picture encyclopaedia to gain knowledge. • Evolves or develops certain information from exposed list, record or data, schedule or sketch adequate to his level.

Table 2-2 Competencies of writing in Arabic language for grade 1

Main competencies	**Sub-competencies**
1. Acquires mechanism of writing.	• Draws letters with their three diacritical markers correctly in their different position (at the beginning of word, middle, and end). • Discriminates in linguistic patterns such as types of elongation, silent and stress in written text. • Recognises appropriate direction in drawing letters and words. • Blends learned letters and rhyme to construct or form new words • Uses acquired writing to write short sentences with consideration of links between letters and spaces between words. • Draws punctuation such as period and question mark in their right position. • Recognises the pattern of arranging writing on a paper: 1. Writes on lines. 2. Leave an appropriate hyphen on both right and left sides on a page. 3. Leaves appropriate space at the top and bottom of the page.
2. Writes from short memory short and complete sentence (around 3sentences).	• Copy or transfer read sentence correctly based on type of handwriting or stripe. • Write from short memory sentences that include familiar words. • Write from memory words about self, context (full name, school, class, country). • Write dictated sentences formed from learned letters correctly (around 3 words).
3. Constructs in writing useful complete sentences from certain or restricted words (3- 4 words).	• Rearranges writing sentences in logical sequence (around 3 short sentences). • Enriches a sentence by one word or more. • Responds to a question linked to a subject. • Expresses in one short sentence the content of a

	picture or situation based on his limited linguistic experience. • Applies his acquired knowledge of vocabulary appropriately in his writing. • Applies his acquired knowledge of linguistic construction correctly in structure or building sentences.
4. Writes 3 complete short sentences from the short memory (around 3 sentences)	• Copies a sentence that he read correctly • Writes a sentence that he is familiar with from the short memory. • Writes words related to himself and his environment from his memory (full name, school, class, country). • Writes correctly some words of dictated sentences made of learnt letters (3 words). • Constructs in writing a complete meaningful sentence of limited words (3-4 words).
5. Write complete short sentences about his experience or what he is asked to wr (at least 3 sentences)	• Rearranges written sentences in logical form (at least 3 short sentences). • Constructs in writing a question about any topic. • Expresses in a short sentence his reflection of a picture or a situation based on his limited vocabulary. • Implements his linguistic resources adequately. • Applies his gained sentence construction knowledge adequately in building sentences.

Table 2-3 Competencies of maths for grade 1

Main competencies	**Sub-competencies**
1. Read and write number symbols of two digits	• Expresses concepts of numbers 0-9. • Identifies number symbols 0-9. • Expresses concepts of two digits numbers. • Reads number symbols 1-99. • Writes number symbols 1-99. • Writes two digits numbers if he knows the components. • Determines the location value of a number of two digits numbers (symbols).
2. Compares and arranges groups of numbers of two digits.	• Compares two numbers each the number of two digits. • Says the number word from 1-99 forward and backward. • Determines the number after and before a number of two digits or more. • Determines the smallest and the largest number among three numbers each of no more than two digits. • Arranges three numbers each around of two digits upwards and downwards.
3. Understands the concept of fraction (a half and a quarter).	• Expresses the concept of fraction a half and a quarter.

4. Finds the sum of two or three numbers which its outcome does not exceed two digits number	• Expresses the concept of summation. • Says the basic rules for sum up to 9+9. • Finds the sum of two numbers each no more than two digits with one condition the total outcome does not exceed 99. • Adds three numbers each of one digit.
5. Subtracts a number from another, the subtracted number consists of one or two digits.	• Expresses the concept of subtraction. • Says the basic rules of subtraction. • Subtracts one number from another each no more than two digits. • Interoperates mathematical sentences on addition and subtraction.
6. Understands some geometrical Concepts	• Identifies some areas such as square, rectangle, triangle and circle. • Identifies and compares some shapes such as cube, and cylinder.
7. Does some geometric construction using appropriate tools.	• Constructs a model using areas and volumes
8. Understands some location relationships.	• Determines the location of things in relation to each other (using concepts of in front, back, on, under, on the right, on the left, closer, farther, inside, outside...etc.)
9. Deals with main measurement units (length, time, currency).	• Compare two things in terms of size such as big, small and length long and short. • Tells the time. • Arrange events based on time sequence. • Determines the days of the week and arrange them on time sequence. • Identifies Bahraini currency.
10. Develops sense of Mathematics.	• Estimates the number of things (around 11). • Determines the numerical relationship between numbers each of two digits based on the quantity.
11. Extracts some relationships or generalises simple mathematical relationships from provided data	• Uses observation to determine the criteria of a concept. • Discovers some simple mathematical patterns and expands them.
12. Reads sketches and simple tables and explain them	• Describes displayed data. • Elicits precise information from displayed data.
13. Arranges gathered data and explains it.	• Puts things in sequence based on one or two criteria. • Gathers information on a certain phenomenon such as months of peer's birthdates. • Records gathered data in a provided table that contains basis of sequencing.

14. Expresses some situations in mathematical terminology language.	• Expresses some mathematical situations in mathematical terms. • Applies mathematical terms in his daily contact.
15. Explains what he does in order to solve a problem. Solves a problem by following steps	• Determines the appropriate operation (+, -) based on certain indication and figures the outcome.

2.3.4.1 The place of the curriculum of grade one in teaching

The curriculum in Arabic language consists of lessons which are presented in units. Each unit consists of listening, speech (discussion), reading and writing. Each child has two books. The first book a reading text begins with a picture which presents the topic of the unit. The children are encouraged to brainstorm some words and sentences related to the topic. Then, they move to a reading passage. The reading passage increases in size and complexity as children progress through the units. At the end of the unit, the children learn a nursery rhyme associated with the topic. The second book is a workbook. The children learn to analyze the sentences in the reading passage into words. Then, they analyze the words into smaller parts (onset, rime and phonemes). The workbook also provides the children a guide in writing some of the letters. It starts with arrows and dots. Then, it provides space for writing the letters with no support. In addition they have other working books for composition and further writing. In mathematics, they have one book which includes activities on sorting, concepts of numbers and simple addition and subtraction.

2.3.4.2 Teacher's assessment in relation to grade 1 curriculum

Teachers in the primary school do not have a guide or materials to support the curriculum. They depend on their own efforts in delivering the curriculum. After each unit they develop a test to check if the children learnt the competencies, and to monitor their progress. They also use the following procedure as a guide to assess children in Arabic language and mathematics.

Table 2-4 The procedures for evaluation in Arabic language for grade 1

Area	Can	Cannot	Comments
Listening Understands teacher's instructions, short stories and other subjects. The teacher uses class work to assess children.			
Speech Speaks fluently using at least 4 correct sentences. During interaction in the class the teacher observes the children.			
Reading Reads aloud fluently with accuracy a passage of 10 sentences. The teacher observes the children in different occasions.			
Writing • Writes some words and sentences following the • instructions in relation to the shape of the letters and space between the letters within a word and between words in a sentence. • Writes dictated familiar sentences at least 10 words. • Uses his own words to write a paragraph of at 3 complete sentences.			

Table 2-5 The procedures of evolution in mathematics for grade 1

Area	Can	Cannot	Comments
Number and counting • Read and write and a number of two digits. • Compare numbers of two digits and arrange them in sequence. • Compare numbers of two digits and arrange them in sequence			
Problem solving • Adds two numbers together (the outcome is of two digits only) • Subtracts a number from another number which is formed of either one or two digits.			
Geometry and measurement • Can use unit of measurement effectively(length, time and money) • Does problem solving of one step			

The above forms are extracted from the competencies of grade one. The teacher uses them during the year. She uses her observations, and the portfolio to evaluate the children.

In an unpublished report, Farjani (2001) noted the findings from a study of pupils who finished grade 3 in Bahrain. Grade 3 is the end of the first round. The first round consists of grade 1, 2 and 3. Pupils in grade 3 have a comprehensive assessment of the main competencies of Arabic language and maths which is expected to be covered during the first three grades of primary education. The purpose of the study was to investigate if pupils reached the expected level of competency in reading writing and maths in Arabic. Reading included reading comprehension and dictation. In reading comprehension, the child was expected to read and understand a passage of 100 words. In dictation, the child was expected to write around 40 words correctly in the context of what he learnt. On the other hand, in writing, the child was expected to pay enough attention to the way words and sentences are written in Arabic; whereas in composition, he was expected to write 50 words on a given topic. He needs to consider coherence in writing the sentences and pay attention to the construction of the sentences, words and letters. Table (2-6) shows pupils' achievements on the main competencies in reading and writing in the Arabic language.

Table 2-6 Pupils' achievements in the main competencies of the Arabic language at the end of the first round (grade 3) in Bahrain

Main competency	Items	Mean scores	0% score	100% score
Reading comprehension	20	44.42	2.15	0.05
Dictation	4	45.15	6.61	0.21
Technical aspects of writing words and sentences in Arabic	1	32.84	26.15	0.05
Composition	20	40.65	0.26	0.0
Total number of competencies	45	43.72		

The results in Table (2-6) show that the average total score in the Arabic language was less than 45% which was very low. The average score in each main competency

was less than 50% which was very low also. The lowest average was in mechanism of writing, and the highest percentage of pupils who scored zero was also in technical aspects of writing. In contrast, the highest average score was in dictation.

The following are the main competencies of maths in the first round and pupils' achievements at the end of the round.

Table 2-7 Pupils' achievements in the main competencies of math at the end of the first round (grade 3) in Bahrain

Main competencies	Items	Mean score	0% score	100% score
Identify and write a numeral of 4 digits	5	40.53	17.20	6.43
Compare and arrange in order a set of 4 digits Numerals	7	43.41	6.07	2.56
Identify and write a fraction (e.g.1/2, 10/10)	5	52.61	8.29	8.66
Add two to three numerals together. The outcome does not exceed 4 digits	2	55.56	11.96	18.63
Subtract a 4 digit numeral from another 4 digit numeral	4	41.98	20.75	6.92
Multiply one digit numeral by another one digit numeral	3	46.40	15.79	14.08
Divide one numeral by another(in the range 9x9)	2	51.15	26.09	33.44
Comprehend some geometric concepts	2	75.18	7.25	63.87
Work with measurement units(length, weight, time and money)	6	53.59	4.58	3.14
Develop sense of math	4	35.72	22.42	4.75
Extract some meaningful mathematical relationships from provided data	2	37.37	39.84	19.32
Interpret information from table or graph	4	44.51	17.24	10.59
Use mathematical terminology to explain some situations	2	46.58	26.69	24.73
Explain an justify the strategy he used to solve mathematical problem	1	23.06	62.27	0
Use learnt procedure to solve some mathematical takes in his life	6	32.01	17.45	0.97
Total number of competencies	55	44.89		

Table (2-7) shows that the average total score in math was less than 45%, which is similar to that in the Arabic language. It can be seen that the scores in all but 5 areas were below 50%. The lowest scores were in meaningful learning and prerequisite

skills such as identifying numerals, concept of order, simple addition and subtraction. It was found that a major problem in maths was related to understanding of the Arabic language. The pupils did not understand what they were asked to do. The second problem was in basic maths concepts which the pupils were expected to learn in grade 1 and consolidate in grade 2 and 3.

Looking at the competencies of grade 1, the evaluation scheme of the same grade and the style of learning, one could draw the following conclusion:

1. It is possible that the learning of Arabic language and maths did not take place in meaningful context and that the pupils mostly learnt by rote. They could not transfer what they learnt in Arabic to another context as noted in Farjani's study. Possibly pupils memorized the letters and words because the class teacher wanted them to do so.
2. I think the idea of "no failure" did not encourage some teachers in grade 1 and 2 to pay sufficient attention to the pupils' learning because they think that the pupils could learn what they missed in the next stage. The same teacher will be teaching the same pupils in the next year, and may have lower expectations of what should be achieved. This was clear especially from table (2). Pupils were supposed to learn in depth numeral identification, concept of order, and simple addition and subtraction during grade 1, but the majority did not.
3. There is no teacher's guide for the class teachers to show them how to use the competencies and the books, and how to assess pupils based on the competencies. There is not enough information about the procedure the class teacher uses in order to complete the form of achievement. There is no comprehensive curriculum based assessment to show if the pupils have acquired, and used the basic skills required in Arabic language and maths. It seems that there is little association between the form the class teacher uses to assess pupils on the competencies of grade 1, and the procedure she used in the assessment. I think CBA was not used effectively in grade 1.The pupils had deficiency in perquisite skills of reading, writing and maths. This was reflected in the assessment at the end of the first round. This was clear in the study of Farjani. Pupils were missing prerequisite skills.

4. Teaching styles are not always clear. Each teacher has her own way of teaching which might not match with the competencies, curriculum materials, assessment, and pupils' styles of learning. There is a deficiency in the materials which can be used to support the curriculum. The results of the Farjani study might indicate that the focus is on rote learning which does not need a lot of effort. Neither competencies nor the evaluation system or even the interviews with teachers mentioned anything about their teaching methods or different learning styles.
5. There is little association between what the class teacher teaches, and what the pupils learn with the special education teacher. Some special education teachers did not have previous teaching experience or they taught in higher levels subjects which were not relevant to Arabic language and maths. I think these circumstances might confuse the pupil who experiences difficulties in both Arabic language and maths
6. A compressive curriculum based assessment which is carried out at the end of the first round is important.

The above forms are extracted from the competencies of grade one. The teacher uses these forms during the year. She uses her observations, and the portfolio to evaluate the children. The teacher has planned competencies and books, but she does not have a guide nor sufficient resources and support to show her how to use them and teach children. It is possible that this type of monitoring assessment is appropriate for "no failure" policy.

2.4 Early literacy

Emergent literacy refers to (Sulzby, 1985:127) said: "*literacy behaviour of young children that develops into conventional reading and writing*". Riley suggested that emergent literacy is (Rilley, 1996: 89) *"concerned with the earliest phase of understanding about print that enables the child to generate hypotheses about the nature of reading and writing"* (Marsh & Hallet, 1999). Children's awareness of the purpose of print and the way it is used is an important step in reading. At age 3, children show literacy learning. Learning reading, writing, and maths as a whole, developed together through social interaction (Marsh & Hallet, 1999).

There are four important domains for literacy development. These are phonological awareness, orientation towards print, comprehension, and utterance. For the purpose of the present research the focus is on phonological awareness and concepts of print.

2.4.1 Reading

This part is divided into two subparts. The first subpart is on phonological awareness. The second subpart is on concepts of print.

2.4.1.1 Phonological awareness

Phonological awareness refers to a child's sensitivity to sound components in words. It is to understand the sound structure of the language which is formed of words, syllables, onset/rime, and sound (phoneme). For instance, "at" is a syllable in "bat". Onset and rime are the two parts of a word or a syllable. The onset is the sound before the vowel. It could be a single sound or a cluster. For instance, "dr" is the onset in "drum" and "b" is the onset in "bat". Rime is a part of a syllable that starts from the first vowel to the end of the word. It is lengthened when a person stresses a word during speech. For instance "æt" is the rime of the words "at", "sat", and "flat" (Adam et al, 1998). Rime is the part of the syllable that has rhyme in the speech. Rhyme is the identity that some words have when we hear them. The written form of the rhyme is called rime. Phonological awareness is the awareness of rhyme in the rime part of a syllable (Center, 2005). A syllable is the large part of a word, and phoneme is the single sound in the word (Cossu, Shankweiler, Liberman, Katz & Tola, 1988; Liberman, Shankweiler, Fischer, & Carter 1974; Adam, et al, 1998; Morais, Bertelson, Cary & Algeria, 1986). For instance, "d", "o" and "g" are the phonemes in a word "dog". An onset can be phoneme when it is a single sound. Phonological awareness takes place in the oral language or speech. A person does not need to know the names of the letters or to link the letter to its correspondence sound in order to developed phonological awareness (Adams, Forman, Lundberg, & Beele, 1998).

This part consists of five sections. The first section is on phonological awareness before school. The second is on the development of phonological awareness and measurement tasks. The third section is on phonological awareness versus phonemic

awareness: the debate. The fourth section is on cross languages orthography and phonemic awareness. The final section is on Arabic language.

2.4.1.1.1 Phonological awareness before school

Young children learn rime during their social interaction at home. The starting point for learning phonological awareness is the children's interaction with their caregivers. The caregivers who value learning literacy provide the children with a rich literacy environment (Lu, 2006). They talk frequently with the children. At an early stage, they read to them picture books and tell stories. At a later stage, they put the children on their laps and read appropriate stories to them. It was found that for caregivers who provide their children with quality of attention in this area, there is a greater possibility that their children become good readers (Anderson, Hiebert, Scott, & Wilkinson 1985; Christian, Morrison, & Bryant, 1998).

Research found that children at 3- 4 years learn rhyme (Bradley & Bryant, 1983; Maclean, Bryant & Bradley, 1987; Pullen & Justice, 2003). Hatcher, Hulme and Snowling (2004) found in longitudinal interventional research that typically developed children age 4-5 years had sufficient phonological awareness, and did not need addition training in phonological awareness.

Phonological awareness at rhyme level is important for future reading. Some studies found that rhyme at an early age is a strong predictor for successful reading in the future (Bryant & Bradley, 1985; Wagner & Torgeson, 1987; Blachman, 1984; Byrne & Fielding-Barnsley, 1991; Bryant, Bradley, Maclean, & Crossland, 1989; Parrila, Kirby, & McQuarrie, 2004; Boscardin, Bengt, Francis & Baker, 2008). It was found that phonological awareness is related to failure in both reading and writing (Bradley & Bryant, 1983; Vellutino & Scanlon, 1987). Phonological awareness helps children to focus on the grapheme and link it to the phonemes (Adams, 1990; Bryant, et al., 1989; Byrne & Fielding-Barnsley, 1991; Tunmer, Herriman, & Nesdale, 1988).

2.4.1.1.2 Development of phonological awareness and measurement

Phonological awareness within words includes syllables, onsets and rimes, and phoneme (sound). Phonological awareness develops from a larger segment, a syllable to onset/rime. Then, it develops from the onset/ rime to phoneme.

Researchers used various tasks to measure the development of phonological awareness in children. Bradely and Bryant (1983) conducted a longitudinal study to investigate the importance of rhyme awareness for reading success. The sample was English-speaking children aged 4-5 years. They used "oddity" tasks. The children were asked to detect the word which was different in its initial sound or medial sound or final sound from the rest of the words. After 3 years, standardized tests were used to measure the children's reading and spelling levels. At that time, the age of the children was between 8-9 years. The researchers found a strong relationship between the children's scores on the oddity task and their scores on the reading and spelling tests 3 years later. This relationship was not affected by the intellectual level of the children.

At the same time Bradley and Bryant conducted an intervention programme for 65 children who scored very poorly on the oddity tasks. They divided the children into four groups. Two groups received training on onset and rime for about 2 years. In one part of the training, some pictures were placed in front of the children and they were asked to sort them on the basis of the shared sound. In the other part, spelling was added to the sorting task. The other two groups were control groups. One group (seen control) received semantic training using pictures. The second group did not receive anything in particular (unseen control). They concluded that phonological awareness is a causal feature in learning to read. Other studies provide further evidence for this causal relationship (Bradley & Bryant 1985; Lundberg, Frost, & Petersen, 1988; Ball & Blachman 1991; Cunningham 1990; Lie 1991; Torgesen, Morgan, & Davis, 1992). Support is observed in children with developmental reading disabilities who had deficiencies in phonological awareness skills (Gough & Tunmer, 1986).

Liberman, et al (1974) used tapping tasks to measures syllable and phoneme awareness in children aged 4 to 6 years. The children were asked to tap once using a wooden dowel for each syllable or phoneme they hear in a spoken word. The results were 46%, 48% and 90% for 4, 5, and 6 years old in sequence on syllable segmentation. For the phoneme segmentation, the results were 17% and 70% for 5 and 6 years, but none of the 4 year olds were able to do the task. Cossu, Shankweiler,

are related skills that must be taught at school, such as phonemes. He added that phonemes are important for reading. Goswami & Bryant (1990) argued that rhymes skills are important for future reading. This connection is independent of the relationship between phonemes and reading. They added that rhyme detection skill is a cause for the development of phoneme awareness skills when the child begins to read. Goswami (1986; 1988) has argued that beginning readers are aware that specific letter sequence represents sounds that have more than one phoneme (Ziegler & Goswami, 2005).

Bryant, Maclean, Bradley, and Crossland (1990) explored rhyme and alliteration in 4 years old children. They asked the children to identify the word with odd sound ("peg", "cot", and "leg"). They concluded that pre-reading measures predicts future reading and spelling in two ways. One is a direct route from rime awareness at 4 years to reading and spelling performance at 6 years. The other is an indirect route which works through sound detection skills at 5 years (Savage & Carless, 2005).

Another argument is that in some studies rime/alliteration and phoneme deletions were not measured at the same time (Muter, 1994; Muter, Hulme, Snowling, & Taylor 1997, 1998). Therefore, it is difficult to say that phoneme awareness has a direct influence on future reading (Savage & Carless, 2005).

Bryant (1998) argued that (Muter, Hulme, Snowling, & Taylor, 1997) instruction to identify the word that has a similar rhyme or sound as the stimulus might be used to identify the onset also. He indicated that one of the provided words begins with the same sound as the stimulus. For instance, if we have a word boat and three words: bike, foot and coat. Both bike and coat are correct answer (Savage & Carless, 2005).

Bryant (2002) argued that Hulme (2002) in his study of 5-6 years old children did not show a direct link between phonemic awareness and future reading. He added that the children were provided with feedback on each experimental trial. It means that the study was on phonological awareness learning more than phonological measurement (Savage & Carless, 2005).

The opponents of this view such as Muter and Taylor (1998) conducted a study on 38 monolingual English children (age 3.10-4.3 years). They used rhyme detection,

rhyme production, word completion for both syllables and phonemes, and phoneme deletion both in the beginning and at the end sounds of words. They found that segmentation (phoneme identification and phoneme deletion) is a better predictor than rhymes (rhyme detection and rhyme production) for reading and spelling than rhymes at the end of the first year of schooling.

Muter (2001) worked in a longitudinal study with a sample of 55 English speaking preschool children from multilingual background in Geneva. She followed them in gradel and 2. The data were collected in time 1 and 2 which has one-year variation. She used the same procedure (Muter & Taylor, 1998). She found that segmentation phoneme tasks were stronger predictors for reading achievement than rhymes tasks.

Hulme, Muter, and Snowling (1998) repeated their studies (Muter, Hulme, Snowling, & Taylor, 1997) which were criticised by Bryant (1998) for differential instruction. They used tasks that contained only similar rhyme tasks. They found that the instruction had no effect on the child choice of the item.

Liberman et al. (1974) argued that children aged 4-5 found it harder to work on phoneme than syllable tasks compared to older children. It was claimed that children are not aware of the phonemes that they generate, and which form of the words they use. It is possible that there is a link between children's skills on phonemes, and their attainment of reading in the future. Some research proved that there is a high correlation between children's identification of phonemes, and their reading level even when the I.Q difference was controlled (Stanovich et al., 1984a; Stanovich et al., 1984b; Tunmer, et al., 1988; Lundberg, Olofsson, & Wall, 1980). It was found that the children who performed poorly in reading were not able to manipulate grapheme phoneme correspondences. Two studies found that dyslexic children who were able to read real word, and had the same level as younger children in reading, functioned lower than the control group on pseudo-words (Frith & Snowling, 1983). It is assumed that grapheme-phoneme correspondence is needed for such words.

Lundberg et al (1988) observed that Danish kindergarten children, who had training on breaking down words into phonemes, and constructing words from phonemes, were able to read more successfully than a control group. They claimed that

motivated to read. They read, smoothly and fluently, the whole print, which makes sense. They become good readers.

Other young children who do not get this sense of meaning might deal with reading as a task that can be broken down into smaller parts (Butler & Clay, 1979). They might analyze a paragraph into sentences. Then, sentences are split into words, and these in turn are divided into letters, which are considered as units for reading materials. These children might fail to be good readers because they might not have a purpose for reading, and they do not have a broad picture of print (Freeman & Sanders, 1989).

2.4.1.2.1.2 Role of parents and preschool teachers

Parents and teachers play an important role in children's development of appropriate awareness of print. In natural context, the children observe their parents reading newspapers, books, letters, and bills. They see print and logo on different products such as milk, bread, and chocolate bars. The parents provide young children with print, and read with them. When the children go to preschool, parent's communications with the preschool teacher is important. They could work together. They point at print to let the children be aware of the print. They provide the children with a variety of print and activities (Weinberger, 1996; Bennett, Weigel & Martin, 2002). With time, the children learn to read, and understand there is a purpose for reading. Lovelace and Stewart (2007) indicated that lack of meaning during interaction with print might be a cause of children's weaknesses in literacy, and language skills. It can be concluded that children must learn, and be attentive to the message involved in reading regardless of the way they apply at the beginning. This does not mean that words and letters are not important in the reading process, but rather they accompany learning the message as a whole. During this process writing begins, and goes along with reading. As a child reads, he becomes attentive to the letters and the words (Hechet & Close, 2002). This can be accomplished with current strategies of learning to read, and the child linking reading with oral language.

Reid (1966) conducted interviews with five years children (N=12) in an Edinburgh school. The purpose of the study was to investigate the children's ideas about

reading. She found that the children did not know what reading was. They did not know why people read and the relation between reading, and writing was not clear to them. Mason (1967) interviewed preschool children (N=197) in Georgia. Mason asked the children if they like to read. Most of the children replied that they do like to read. In reality, they could not read. Few children said: "Yes, I like to read, but I can't!" Mason thinks a person's knowledge that he does not know how to read is an important step for learning to read (Johns, 1980). It is important that the teachers take into account that children differ in their past experiences, types of print they were exposed to, and not the amount they know. They need to consider that learning rules of print needs time. During the teachers' experiences in reading stories or writing, they ask the children some questions to make sure that the children know reading instructions (Day & Day, 1979; Day, Day, Spicola, & Griffin, 1981).

It can be concluded that both parents and preschool teachers play an important role in children's literacy or reading.

2.4.1.2.2 Development in concepts of print

Many terms were used to describe teaching reading. For instance, Downing (1976) introduced the term "reading register"(Day & Day, 1979). Samuels (1979) preferred to use two terms "language of instruction" and "conventions of print" (Day & Day, 1979). The children who begin to read do not understand what a word and sentence are (Clay, 1972a; Francis, 1973; Downing & Oliver, 1973-74; Papandropoulou & Sinclair, 1974; Johns, 1977, 1980; Fox & Routh, 1984). They find such terms difficult and confusing (Day & Day, 1979; Day et al., 1981). Many researchers made (Downing, 1971-72; Downing & Oliver, 1973-74; Francis, 1973; Johns, 1977; Papandropoulou & Sinclair, 1974; Reid, 1966) emphasis on the ideas of reading, words and sounds. They also focused on the knowledge of print such as start to read from the top left hand side of the page, and to read from left to right and other important procedures (Day, et al, 1979).

Clay (1972) created a list of items for concepts of print. She developed four booklets for observation: Sand (1972); Stones (1979), Follow me, Moon (2000c), and No Shoes (2000d). These booklets are used during the first two years of schooling, and

their purpose is to observe what the children know, and what they not know about print concepts or sounds. These books could be used for non-readers or children who are beginning to read. It seems that concepts of print might be useful as indictors of children's behaviors. It is important that the observer is familiar with the administration of these booklets. A teacher can use one of the Clay's books to recognize what children know about print, and what they need to learn. For instance, in New Zealand (1997), after the first six weeks of school enrolment, grade 1 children took an assessment on concepts of print, and the results were average 58%, good 8%, and modest 33%. It appears that very few children identified the main elements of print. The children are expected to have higher scores after two years. Since 1960, it has been observed that children, who enter school, learn about print, words, sounds, and letters during their involvement in literacy activities.

Concepts of print can be divided into three main parts. These are print forms, print conventions and book conventions. Print forms are used to make it clear for the children that print has units such as a letter (a) and number word (1). Each has a name, and could be discriminated from each other. Print conventions are use to provide the children with an understanding of the way print is organized. In English, print is read from top left to right, and sweeps from one line to another in sequence until we reach the bottom of the page. Book conventions are used to help children to understand how a book is developed functions, and is organized. The children need to learn that a book has an author. The author is the person who writes the book or the story. They need to know that the book has a title, front, and back cover (Lovelace & Stewart, 2007).

Downing (1970) reported that Clay (1966) observed five-year-old children at the beginning of the year, and found that 60% of them thought that the pictures tell the story, and not the print. After six months of schooling, 90 % of the children said that the print tells the story (Day, et al, 1979). Robeck and Wiseman (1982) conducted a study on 20 children aged 4-5years. They revealed that the front part of the storybook was very easy. A few children distinguished between the print, and picture, and identified some words.

Bialystock (1995) explored understanding of reading in 3-6 year children. She showed the children pictures, shapes, squiggles, cursive writing, and printed words. She observed that all the children were confused if the pictures are readable. It might indicate that these children, when they listened to their parents reading a story, were not sure if it is read from the picture or the print. DeGoes and Martlew (1983) investigated the understanding of reading in 4-6 years old children. They found that the younger children accepted a string of letters as words; whereas the older children accepted a string of letters of a certain length as words.

Christie, Enz, and Vukelich (2003) indicated that the distinction between the picture and the print is important. It helps the children to understand that the print has its own identity. They learn its function and structure. They added that it is one of the first concepts that children learn about literacy (Lovelace & Stewart, 2007).

In summary, children need to develop an orientation to print and meaning in some general sense as a foundation for learning more specifically about alphabet principles related to print and reading.

2.4.1.3 Concepts of print and future reading

There is a relationship between awareness of concepts of print and future success in reading. Johns (1982) indicated that concepts of print are a consequence as well as a cause of reading progress. Dickinson, McCabe, Anastopoulos, Peisner-Feinberg, and Poe (2003) conducted a study on 533 preschool children who participated in Head Start program. The age range was 3-4 years. They investigated the relationships among receptive vocabulary, phonological awareness, and print knowledge. They found a bidirectional relationship between phonological awareness and print knowledge, at least until the end of kindergarten. They showed that both vocabulary and phonological awareness predict print knowledge. Nichols, Rupley, Rickelman, & Algozzine (2004) reported that print is important for reading. Hammill, (2004) and Snow, Burns, & Griffin (1998) revealed that concepts of print are among the best predictors of later reading. Other researchers reached similar findings (Bowey, 1994; Burgess & Lonigan, 1998; Ehri, 1998; Johnston, Anderson, & Holligan, 1996; Lonigan, Burgess, & Anthony, 2000; Stahl & Murray, 1994; 1997; Stuart, 1995; Badian, 2001).

Lovelace and Stewart (2007) reported that Tunmer, et al. (1988) found that children's awareness of concepts of print has a significant relationship to their ability to identify real words and decode pseudo words at the end of grade 1. They added that Scarborough (1998) found that phonological awareness, concepts of print, and other skills have positive correlations with future reading competency. Adams (1990) and Mason (1980) mentioned that various print forms lay the basis for reading and writing learning.

Lovelace and Stewart (2007) reported that Whitehurst's (2002), in his model of precursors of reading, found that kindergarten children's knowledge of print is more important than alphabet skills. Hecht, Burgess, Torgesen, Wagner, and Rashotte (2000) reported that Tunmer et al. (1988) found that concepts of print are necessary to identify sounds in words during the decoding process of new words. Mason & Kerr (1992) indicated that knowledge of print helps children to understand what the teacher is referring to when she uses terms such as a letter and word during the instruction. These findings showed that the children who begin formal reading with well-developed knowledge of print will have better attainment in reading than those with less developed knowledge of print (Justice, Bowles & Skibbe, 2006). Other studies showed that both phonemic awareness and concepts of print are important for word recognition and reading comprehension (Hardy et al., 1974; Yopp & Yopp, 2000).

Hardy et al. (1974) stated that visual language, such as locating left and right on a page, the title, and a line within a text, were not easy for preschool children. Some of them still struggled with these concepts even at the end of the year (Nichols et al, 2004). They indicated that lack of visual and auditory conventions of the print has an effect on reading acquisition (Hardy et al., 1974; Johns, 1980).

Hiebert (1981) and Mason (1980) found that some young children were able to name some letters, and read some words in their appropriate context too. Hiebert (1981) indicated that 3 years old children developed awareness of print. He added that the children knew that people read for a purpose, and what they do when they read. Some studies showed (Clay, 1979a; Day & Day, 1979; Day et al. 1981; Sulzby, 1985) that the children could hold a book in a proper way, turn the pages from left to

right, and discriminate print from picture. Other studies (Dyson, 1981; Ferreiro & Teberosky, 1982) found that the preschool children were developing some strategies to match oral segments to written segments and letter to sound relationship (Lomax & McGee, 1987).

Day et al. (1981) investigated kindergarten (N=56) children's knowledge of print concepts, and orthographic linguistic awareness. In the beginning of the kindergarten, all children knew how to handle a book. Few of them pointed at the picture instead of the text when they were asked where to begin reading. One of the children continued to have this error in grade 1. Most of the children at kindergarten level knew that the left page is read before the right page in English except 10% of them had difficulties even in the beginning of grade 1. Half of the children in this study knew the direction rules, but 20% of them were confused even in the beginning of grade 1. Most of the children were confused with punctuation. They did not know the name of period, and its function. They concluded that there was a significant correlation between reading achievement measured at the end of the first grade, and a measure of the child's knowledge of the conventions of print even if it is administered at the beginning of kindergarten. They added that orthographic linguistic awareness has a direct effect on reading competency in the beginning of grade 1.

Sultmann, Elkins, Miller and Byrne (1983) conducted a comparison study on the awareness of concepts of print among three groups of readers (poor, average, and good). The sample size was 129 children, and the age group was five years. They found that most of the children pointed at the front of the book. They knew that the print is the part that carries the message, and not the picture. They knew that the left page is read before the right page in English. One of the differences among the groups was on print direction concepts which are to begin reading from the top left, then moves left to right, line by line. This finding is similar to Johns (1980, 1982). However, letter-word concepts were the powerful discriminators. They found that the beginner readers had problems in differentiating the capital letter from the small letter, one and two letters, one and two words, and first and last letter. All the three groups were poor on advanced print items which were punctuation, and reversible

words. It either indicates that the children did not have enough instruction in these items or they are developmentally not mastered

In an early childhood longitudinal study, the National Centre for Education Statistics (Zill & West, 2001) reported that 61% of young children who began kindergarten were familiar with two or more concepts of print skills such as reading from left to right.

Lomax and McGee (1987) found in their study of kindergarten (3.6-5.6) and grade 1 (6.7 years), that young children, before they start reading, have a great knowledge of written language and processes of reading and writing. They revealed that concepts of print have an important direct role on letter-sound correspondence. They mentioned that discriminating between words and letters visually depends on the children's knowledge of print. They claimed that this finding is consistent with the developmental sequence proposed by Ferreiro and Teberosky (1982). They reported that Ferreiro and Teberosky (1982) think that children discriminate between print and pictures, and at the same time they predict text from pictures. They added that children pay attention to the graphic form of text, and make hypotheses to find a relationship between speech, print, and meaning. Then, they look for a graphic and sound correspondence relationship. In summary, helping children to explore concepts of print is important for literacy acquisition, and long-term learning.

Justice, Bowles and Skibbe (2006) investigated how suitable the Preschool Word and Print Awareness (PWPA) is in measuring the preschoolers knowledge of print. The sample was preschool children, 3-5 years old, from different ethnic and socio-economic groups in the United Sates, who were enrolled in intervention programs. They found that the instrument is suitable to measure the children's concepts of print. It was sensitive to the differences among the children, and identified the children at risk. They reported some comments on items used in the test. For instance, the easiest item was to point at the front part of the book. The most difficult items were to point at a particular word in the book, and to point at the direction of reading top to bottom or left to right. Justice, Bowles and Skibbe (2006) reported that the National Early Literacy Panel (NELP) concluded from their study of 324 papers, that the child's

ability to decode words before first grade is the best predictor of decoding skills in first grade and beyond.

Lovelace and Stewart, (2007) studied 11 preschool children with language impairment. They found that all the children were able to identify the page, the top, and illustration in the book at the end of the shared reading program. None of the children identified the direction of reading as left to right, from left to right, letters, first line next page, and the end of the story. The missing concepts were identifying words, first letter, last letter, title, beginning of the story, and back part.

The above studies indicate that children's knowledge on concepts of print is important for future reading achievement. In conclusion, both phonological awareness and concepts of print are important, for both reading and writing.

2.4.2 Writing in children

Writing is part of literacy. Writing is an important skill, and it is a part of the learning process. Children learn to write through interaction with other people. This section is concerned with writing. It is divided into two parts. The first part contains basic knowledge on writing and some problems of writing. The second part is composed of the four items which were used in identifying children with writing problems in this research. These are writing a child's own name, drawing of a human figure, writing a text and copying shapes.

2.4.2.1 Basic knowledge on writing and problems of writing

Writing depends on oral language and reading (Johnson & Myklebust, 1967 in Fitze, 2003). They share the same verbal system. Problems in oral language and reading could lead to problems in writing. Abbott & Berninger (1993) indicated that writing requires development in motor functioning, visual-motor integration, phonological coding, and word finding (Fitze, 2003). This part is composed of five subparts. The first subpart is on definition of writing, types of writings, and main elements in writing. The second is on drawing and writing in children. The third is on the development of writing in children. The fourth is on important aspects in writing. The fifth is on writing problems in children.

2.4.2.1.1 Writing definition, types, and elements

Writing refers to communication performance or action that involves transferring of various messages in different ways. It can be used to begin contact, provide information, persuade, entertain, and exchange ideas. In addition, writing clarifies and organizes a person thought, and makes sense of his experiences (Kress, 1997). There are three types of writing. The first type is expressive which is personal and like speech. It is used in expressing feeling, thought, and experience. It could be writing letters to friends or a personal diary (Marsh & Hallet, 1999).

The second is transactional which is used to get things done. It is an instruction style, record, advice, and report (impersonal). The third type is poetic writing, which is art style with selected vocabulary, functions in entertaining people. It might contain stories, songs, or rhymes. Children's writings are expressive. They describe what they consider important. They like to write their names, family members, and their own experiences. The children know about transactional writing because they see their parents making shopping lists and food packages. The children who share reading, and participate in discussion could write their own stories (Marsh & Hallet, 1999). These are the main types of communicating written messages among people.

On the other hand, there are three elements of writing, composition, transcription, and review. Composition requires thinking about what to write, to whom, and what way. An individual first produces ideas and then selects the most appropriate one. Sometimes, the individual changes his selection. Transcription means to convey thought into paper, and it depends on the previous processes, purpose, and readers (audience). It includes handwriting, spelling, punctuation, grammar, and layout. Review is to go through what has been already written. There might be changes in part of it to sound better (could be composition or transcription). Therefore, it is important to ask children to read what they have written, and discuss with others. An example is a three-phone message thought. It is in composition form. When it is written, it is transcribed. Going through it to make sure, it is clear is a review. This might be difficult for children, and it takes a long time to practice (use letters to

generate words). Therefore, it is important to train children on this format continuously (Marsh & Hallet, 1999).

2.4.2.1.2 Drawing and writing

Young children draw before they write. There is an argument as to whether drawing and writing are controlled by the same area in the cortex or whether each has its own route in the brain. Adi-Japha and Freeman (2001) investigated this issue. They also explored whether suppression of drawing is important for fluent writing as was argued by Zesiger, Martory, and Mayer (1997). The sample consisted of 4-12 year old children. They asked the children to draw. They used drawing within a picture, writing within script, writing within a drawing, and drawing within writing. They used O and V letters for the writing. For the drawings, they used circles and teeth. They found it difficult to discriminate the drawing and the writing of the 4 years old children. They concluded that the route or the area that controls both drawing and writing for this age group is the same. For the children age 6 -12 year old, they revealed that these children were more fluent in writing than drawing. They concluded that at age 6, the route of writing in the brain is more clear, and separate from the route of drawing. They also supported Zesiger, Martory, and Mayer (1997) claim that suppression of drawing activates writing. They mentioned that on a writing task it is better to provide a child with a paper and pencil which are different from those he uses on drawing task. They argued that it enhances his readiness for writing, and suppresses the drawing.

Yamagata (2007) conducted a study on 66 Japanese children. The range of age was 1.9-3.10 years. The children were asked to draw a human figure, and write their names. They were asked to write some words, numbers, and letters. He found that the children at age 2 differentiated in their written marks between drawings, numbers, and letters. They began to draw before they wrote. He revealed also that development of number writing was faster than letter writing.

Tolchinsky- Landsmann and Levin (1985) conducted a study on three age groups of preschool children (3.6, 4.6, and 5.6) who speak Hebrew. The number of children in each group was 14 boys and girls. Each child was provided with a blank paper at a

time, and was asked to draw a house, a child playing with a ball, sky and a red flower. Then, the child was asked to write the words in Hebrew for each of the four drawing. The child was asked to tell what he drew, read, and wrote. He was instructed to use his finger to trace it. Then, the child wrote down his name. Finally, he was asked to sort the drawings and the writings. It was found only three children in the 3 year old group could do the sorting. One child did that in random and two children sorted their writings as drawings. The 4-5- year old children had no problems in sorting their drawings. Then, two judges sorted the drawings and the writings. The judges had no problems with the 4 to 5 years old's work, but for the younger children they sorted 23 and 22 writings as drawings, and 17 and 15 drawings as writings. This indicates that 3 to 4 year old children were not mature in writing.

In summary, children 5 years old and over have a separate route that controls their drawings and writings in the brain. Adults can distinguish between the 5 years old drawings and writings. These children are more fluent in writing than in drawing.

2.4.2.1.3 Development of writing

Children's early literacy experiences are embedded in a familiar situation in a real life experience (such as family and community) where they read, and write naturally. A process of early writing development is characterized by children moving from playfully making marks on papers through communicating messages on a paper, to making texts as art craft. When children understand that their marks on paper could be meaningful, and they enjoy producing them; they might learn how to write, select what, when, and how to write. Besides that, it is important that children have the desire to write because external pressure does not work. They respond to situations where writing is meaningful. Producing and telling stories proved to have an important role in the development of literacy and the children's thinking (Morrow, 1989).

Children learn using written language before learning forms. A child can transform an experience of verbal symbols in the text to become a reader through reconstructing text to construct anticipated meaning. He learns reading and writing through trial and error. He mixes drawing with writing letters, invents, and decodes

words. He invents different forms of messages and shapes (Morrow, 1989). A child's fluent oral language depends on meaning, so he pays less attention to print. Whereas, in creative writing the child's focus is more on print because he has to form words letter by letter. Therefore, he becomes more aware of letters features and sequence. When children write they integrate knowledge of reading with knowledge of writing, and they need little direction. In addition, they require models and support talk about reading and writing. At the same time, they need people to praise their efforts (Morrow, 1989).

When children are ready to write, they begin to write on walls. Next, they draw on paper. They start with a scribble. Then, they write with repeated shapes that appear as letters or joined up scribbles. They use in their writing limited number of similar shapes that need similar figure movements. Dyson (1986) divided writing development into two large parts. The first is from birth to age 3, and the second part is from three to six. The writing in the former stage is in a form of scribble; whereas in the latter stage as described by Dyson(1986:118) is: "*controlled scribbling, gradually develops into recognizable objects, which they name, and similarly, the scribbling gradually acquires the characteristics of print, including linearity, horizontal orientation, and the arrangement of letter-like forms...*"(Marsh & Hallet, 1999).

Sulzby, Barnhart and Hieshima (1988) carried out a longitudinal study on children from kindergarten to grade 1. The aim was to explore the pattern of children's writings. They found that scribbles were used as writing for a while, and then the children invented their own spelling. They developed 12 categories for the development of writing in children. These are:

1. Drawing: It is one picture for the entire writing or one picture embedded with other forms of writing.
2. Scribble-wavy: It is continues curve or zigzag form with no clear or different shapes.
3. Scribble-letter-like: It consists of different scribbles similar to letter features.
4. Letter-like units: These are scribbles invented by children close to letters, but they are not letters.

5. Letters-random: It is production of random letters with no link or message.
6. Letter-patterns: It consists of repeated patterns of letters.
7. Letter-name elements: Letters are arranged in a repeated pattern. These letters might be from the child's name.
8. Copying: Use of words and letters which are copied from print in his context.
9. Invented spelling-syllabic: Children use one letter for a syllable in a sound letter relationship.
10. Invented spelling-intermediate: All the invented spelling between syllabic and full.
11. Invented spelling-full: Children use a letter for all spoken sounds in the writing.
12. Conventional: Children use conventional form with correct spelling (Yang & Noel, 2006).

There is no precise developmental sequence for writing, and teachers can use this form as a useful guide only (Goswami & Bryant, 1990).

2.4.2.1.4 Important aspects in writing

There are some aspects which young children need to develop in order to be a skilful writer. Dyson (1985) identified three of these aspects. The first is the perceptual aspect in writing. Young children use their visual perception in order to be familiar with print in their context. They focus on the direction of writing, letters, and words. They pay attention to how to write the letters and other graphic aspects. In the beginning, the children take a general view on how the text is written, so they scribble. Then, they focus on the details such as how a distinctive letter is formed (Zecker, 1996).

The second is the symbolic aspect of writing. Dyson (1985) and Gundlach (1982) investigated the children's knowledge or ability to distinguish between writing symbols and drawing in one hand, and writing and oral language on the other hand. They found that children used all symbols to communicate. This might explain why some children use big familiar symbols to describe a long string of letters. Other studies paid more attention to the rules and graph phonemic awareness. It was

observed that children became aware of the link between oral language and print. Through constructive learning, the children learn more about the alphabet and morphophonemic basis which are important in orthography. At the beginning they learn about a letter and syllable units. Then, they understand that each letter is corresponding to a particular phoneme (Ferreiro & Teberosky, 1982 in Zecker, 1996). Zecker (1996) reported that some researchers such as Ferreiro (1990) claimed that children go through sequential stages in order to develop an understanding of this concept of print. She mentioned that Sulzby (1985b) argued that the child acquires this concept at any time.

The third aspect is psychosocial aspect of writing. Dyson, (1985) indicated that the structure knowledge is important in the development of writing. The children need to discriminate between oral and written structure of the language. They have to learn different structures and contents that are used in different style of writing such as a list, a story, a letter, and poem. The topic, purpose, audience, and author determine the structure of the writing. Some researchers (Chafe, 19821985; Ochs, 1979) mentioned that written language is more explicit than oral language. It is more compact, hard to be changed, and semantic. In oral language the person communicates, and he is involved more with other people. All these features have effect on the structure, grammar, and semantic aspect of oral and written language (Zecker, 1996).

Children write for meaning. McLane and McNamee (1990) indicated that pretend writing, the children produce during play, has a meaning for them. Klein (1985) and Sulzby (1986) argued that the children, who give their writing to adult to read, convey meaning from the children's point of view (Bialystock, 1995).

Tolchinsky- Landsmann and Levin (1985) in their previous study mentioned they analyzed the child's writing and own name based on super ordinate features of a text such linearity, presence of units, regularity of blanks, and constricted size relative to drawing. They also analyzed them on ordinate features such unidentifiable source; non-letters; characters of mixed origins; unrelated Hebrew letters; and Hebrew letters related to the utterance. They found that children's writings at age 3 years and above were at the graphic level. They could link between graphics, content, and the sound

in oral language. The 4 years old children could identify the super ordinate features. They found that the children used the utterance which was provided by the experimenter as clues in their writing. It shows the way they understood the link between oral and written language. Some children used only nouns (objects and names) in their writing. Other children used segmentation for utterance. They tried to match each character to a phonetic segment. Some of these children used phonetic analysis in their writing. Others matched the number of phonic segments they read with the number of symbols they write. In terms of the number of characters in writing, older children used 3 characters per utterance. In ordinate features such as right to left direction in Hebrew, children who were aged 5 and over did very well.

In summary, young children learn these aspects through interaction with people and print. It is possible that the children learn these three aspects together.

2.4.2.2 Problems of writing

Writing problems may be associated with a child's self-esteem. There are some causes for writing problems in children. First, children might have attention problems. It can take different forms. A child might experience difficulties in starting to put ideas on paper. He is distracted very easily or becomes tired while writing. It is possible that his writing is unclear, and cannot be read. Sometimes, the pace of a child's writing is uneven or he does careless mistakes in writing (Alston, 1993).

Second is a spatial ordering problem. A child with a spatial ordering problem has a problem in placing together his letters, words, and sentences on paper. This problem can be observed in several forms. For instance, a child cannot write on lines or leaves uneven spaces between letters. He might have difficulties in organizing his writing. He misspells words.

Third is a sequential ordering problem of letters. For instance, a child might have difficulty in keeping his letters process or ideas in order. It can be observed in some forms. A child might experience difficulties in forming letters. He dislocates or omits some letters. He experiences difficulties in moving from one idea to another. It is possible that he finds it difficult to put his writing in a narrative sequence.

Fourth is a memory problem. Writing needs an active memory in order to retrieve well-organized ideas, spelling, rules of grammar, and punctuation. Memory problems can be seen in a lack of vocabulary, spelling problems in words, grammatical, and punctuation mistakes.

Fifth is a language problem. Writing depends on a child's language level. Language problems take several forms. For instance, a child might use informal language, irregular phrases, and grammar in his writing. He might have little vocabulary and cannot form correct sentences. He might experience problems in words in terms of sound, spelling, and meaning. A child finds it hard to read what he wrote.

Sixth is a graphic motor problem. A child lacks coordination in his finger muscles, so he finds it hard to hold a pencil, and write on a paper. This problem takes several forms. For instance, a child might have inappropriate pencil grip. It is possible that he writes very slowly, and cannot form letters. He might experience problem in cursive writing (Alston, 1993). The above are some of the problems that some young children come across when they write.

2.4.2.3 Items used in assessing children problems in writing

This part contains four items which were used in assessing writing problems in young children in this research. These items are child writing his own name, drawing a human figure, writing a letter to a favourite person, and copying shapes.

2.4.2.3.1 Child name writing

In this part, there are three sections. The first section is on a child's preference for his name. The second section is on the development of name writing and literacy. The third section discusses the research which used name writing to identify young children with learning problems in reading and writing.

2.4.2.3.2 Preference of one's own name

A child's own name is almost the first meaningful word a child learns (Bloodgood, 1999). It is one of the most meaningful experiences with print (Haney, 2002). It is connected with sense of self, and his identity. The name helps the child to discriminate himself from others. At age 2, he develops a sense of self-categorization

with others into different and the same. Vygotsky (1962) noted that when the child becomes aware of object names, it means that his thought and language are working together to create intellect. The child learns that people, like objects have names. He develops an awareness of his name, and identity during social interaction with people. In a family context, parents talk to the child by calling his name to provide him with his needs or start a conversation. The name is used in preschool to label his belongings such as lunch box and work (Bloodgood, 1999). Hoorens et al. (1990) used a phrase "name letter effect" to explain that the child's exposure to his own name in oral and print enhances him to develop preference for writing his name. The child learns to write his name from observing others when they write (Hildreth, 1936).

2.4.2.3.3 Development of name writing and literacy

A child follows a sequence in writing his own name. At age 3, the child makes scribbles when he writes his name (Hildreth, 1936). As he grows up, he moves from circular scribbles to continuous linear scribbles similar to letters. Then, he uses symbols like letters, and at the end he produces real letters (Hildreth, 1936). Levin and Bus (2003) found that children start writing by drawing. At about 4 years, one could discriminate children's writing from drawing. In writing they use some letter or shapes similar to letters. They group them together to create segments separated from each other by a space. Levin and Bus added that preschool children begin to copy some letters, and then use these letters to write their own names.

Writing name is an important block stone in early literacy development (Ferreiro & Teberosky, 1982; Welsch, Sullivan, & Justice 2003). The child focuses on producing the letter, the movement and orientation of the hand in order to print (Aram & Biron, 2004; Bloodgood, 1999). Hildreth (1936) and Haney and Behnken, (2003) developed a name writing scale. They inserted some criteria such as alignment of name on a paper, capitalization, spacing, the size of letters, and correct spelling. Yang and Noel (2006) investigated the drawing and own name writing of 17 American preschool children. The age of the children was between 4-5 years. They found that the children at age five could write their names correctly following these criteria. Some of these children wrote their full names.

Writing his or her own name motivates a child to learn literacy at an early stage. He or she begins to use the letters in their name more than other letters. They investigate their own name, and forms ideas about letter names, and sounds. Treiman, Weatherston, and Berch (1994) found that the child uses his knowledge of letter names to learn grapheme phoneme correspondence. For instance, he uses y for w in yellow (Haney, 2003). He uses symbols in his life for meaning, and to develop print knowledge (Bloodgood, 1999; Treiman & Broderick, 1998). The child's interest in the letters in his name helps him to learn, and remember words which have connection with his name (Rogers, Kuiper, & Kirker, 1977).

Bloodgood (1999) studied writing of a sample of 30 children aged 4- 5-years old. She found that they used the letters in their names in 30-50% of their writing. Name writing indicates that the child constructs his own learning to develop his writing skills. Such experiences assist the child to understand that print has a function, and he becomes aware of literacy in his surrounding (Bloodgood, 1999).

2.4.2.3.4 Name writing as predictor for learning problems

Research found that name writing can be used to predict young children's learning problems. Riley (1995) conducted a study on 191 preschool children. They found a correlation between the children's letter naming and name writing when they enter school, and their reading at the end of the grade 1. They indicated that both letter naming and name writing were strong predictors for reading. In another study, Riley (1996) worked with 160 kindergarten children. He used name writing in the beginning of grade 1 to predict reading attainment at the end of the year. He asked the children to copy their names, and applied a 7 point scale for scoring. He found a relationship between name writing, and word, and non-word reading.

Bloodgood (1999) explored the skills related to name writing in a sample of 67 children aged 3-5 years old. She found an association between recognition of name and age in the 3 years old children; whereas name production had a relationship with alphabet knowledge, word recognition, and concept of word for 4 - 5 years old. She indicated that the quality of the name writing could provide an idea about the quality of motor control. Behnken and Haney (2002), in their study of 162 preschoolers,

supported Bloodgood findings. They confirmed that name writing was associated with word reading only. They added that name writing is important for reading prediction skills. It provides information such as development of dictation, spelling, word recognition, and concept of word.

Clay (2002:18) argued that: *"writing is of critical importance for learning to read"*. When children write, they focus on the print, and they learn to differentiate between different forms of letters. They learn the letter names from writing. It was revealed that the skills which are related to print such as knowledge of letters, name writing, and concepts of print are the best predictor for future reading (Hammill, 2004; Snow, Burns, & Griffin, 1998).

Haney and Behnken, (2002) used the above scale for name writing. They conducted a study on 59 preschool children. They used name writing with emergent language tests to compare American preschool children who had language impairment and typically developed children. They found that name writing could be used to identify the children at risk of developing reading problems by checking phonological awareness, rapid naming, and letter knowledge (Adams, 1990; Perfetti, Beck, Bell, & Hughes, 1987; Torgesen, Wagner, Rashotte, 1994; Vallutino & Scanlon, 1987) to predict future reading. They mentioned that using name writing in a reading screening test might reduce the false positive cases. They found that a relationship between name writing, and alphabet knowledge, and concepts of print. They revealed a significant difference between the two groups on name writing. They concluded that name writing could be used as a predictor for writing too.

Dunsmuiri and Blatchford (2004) carried out a study on 60 British children before and after school entry. They found a relationship between a child's ability to write his own name at school entry and his writing outcome later.

Blair and Savage (2006) worked with 38 Canadian children who were 4-5 years old. The purpose of the study was to investigate the relationship between phonological awareness, reading, and writing skills. They asked the children to write their own name, name some environmental print, and identify correct name and environmental words. They revealed that name writing and name identification were related to

phonological awareness. They indicated that the relationship between name writing and phonological awareness is unique. They thought that the children used phonological awareness in their name writing and identification before they read.

Molfese, Beswick, Molnar, and Vessels (2006) carried a study on 55 American preschool children whose mean age was 65 months. They used letter naming, word reading, writing own naming, writing dictated letters and numbers, and copying some shapes. They found that 30% of the children scribbled their name, 13 %wrote the first letter of the name, and 41% wrote all the letters in their names. The scores on writing own name were higher than the scores of writing dictated letter name or copying letters. They found a relationship between letter naming and children's writing skills in writing letters and numbers.

All the above studies showed that the quality of young children's name writing is important for both reading and writing. Children need phonological awareness, concepts of print, and letter knowledge in writing. Writing own name can be used to discriminate between children with literacy problem and with no problems.

2.4.2.4 Drawing of human figure

This section consists of three parts. The first part is on the development of the Draw a Man Test and the theory. The second part describes a simple scale for the drawing of a human figure. The third part is on the use of the test in children.

2.4.2.4.1 Development of "The Draw a Man Test" and theory

Goodenough (1926) developed The Draw a Man Test to assess children's mental development. She standardized the scoring in the test on a sample of 2,300 children whose aged range was between 4-10 years old. Machover (1949) revised the test, and called it Draw-A-Person (DAP). Machover mentioned that the test can be used to measure both conceptual level and personality. The scoring is reliable and correlated with intelligence test scores. The way human figure drawing is arranged with its fine details in a developmental level provides important information about the child's stage of cognitive development and intelligent (Deaver, 2009). Scribner and Handler (1987) described the pattern in which the scoring focus on the norm and quantitative

level as thinking approach. The test is non-verbal which can be used with children with limited vocabulary. It can be used in different cultures.

Luquet (1927/2001) indicated that a child makes an internal model of the object that he saw as a transition from intellectual realism to visual realism. He added that the child draws from the internal image. Around age 7-8 years, the child moves from intellectual realism to visual realism. He considers the space in his drawing, and he draws the parts of the body which can be observed from a certain viewpoint. Inhelder and Piaget (1958) mentioned that the internal image is more important in adolescent. Kellogg (1969) mentioned that the child draws a figure which is not a correct representation of the actual object. Ricci (1887) proposed that the child does not draw what he sees of the object, but what he knows about the object.

Kersschensteiner (1905) mentioned that the child selects the elements which are central to his idea of the object and draws them, but he does not draw everything he sees. Heinz Heckhausen (1961) thought that transfer from intellect realism to visual realism takes place alongside with part whole integration. Children begin their drawing with a circle, and they modify the shape and integrate it into the figure by merging the contour of the shapes into one of the whole (Ku¨ttner, Kerzmann & Heckhausen, 2002).

Freeman (1980, 1987) argued that children need to coordinate several distinct skills in order to produce drawings. First, he needs to form a mental form of what he wants to draw. Freeman (1975; 1980) indicated that the child scans his internal model from top to bottom before he begins to draw. He retrieves this information when he draws each part. Freeman mentioned that the child selects the head and the legs as the main parts. Second, he uses this image as a guide to make a graphic plan of action. Third, he selects types of marks and tool of drawing devices. He explained that sometimes, a child experiences difficulty in accessing the mental model of the drawing. Therefore, he cannot make a plan (Cox, 1992).

Cox, Brittain and Chien (1983) found that tadpole drawers have great knowledge about the body parts, and they could identify the parts, and provide their appropriate names. Cox and Stone (Cox, 1992) provided young children with drawings of

tadpole, transitional, and conventional figures, and asked the children to select one of them. They found that 21 out of 25 children selected the tadpole. This finding might contradict with Freeman's idea of incomplete internal model that prevents the child from drawing a conventional figure. Cox, (1993: 31) said: *the children "use the tadpole as a kind shorthand form which readily evoked the idea of a person and is easily recognized as such*".

Cox (1993) studied 133 children aged 2.11-6.2 years and she found that most children drew a tadpole figure between 3-4 years. She found that the youngest child who drew the tadpole figure was 2.9 years old. Cox (1993) explained if the child added the arms to his drawing it means that he viewed them attached to the torso, and not to the head. Cox believed that tadpole figure is an invention of a child, and it is not copied from elsewhere. Cox (1993: 27) concluded from other research (Elkonin, 1957; 1969; Luquet, 1913; Piaget & Inhelder, 1956) that: "the *production of a drawing depends on the child having abstracted the distinguishing and invariant features of an object which differentiate it from others; these are then stored as an internal model*".

Arnheim (1974) mentioned that the torso is included in the tadpole. He explained that the internal model of the child for the human is complete, but the head and the torso were not separated. He suggested asking the child to identify each part of his tadpole drawing.

In summary, children have an internal model of the human figure. The content of the model depends on what the child considers as important when he internalized the information. From the point of view of the child who is at the intellect realism stage any model is complete. At the visual realism stage, the child internalizes what he sees. He is very careful about the details.

2.4.2.4.2 Scale for drawing a human figure

Cox and Parkin (1986) described five separate categories for human figure drawing:

1. Scribbles: Children make random lines scattered on the page with or without an initial point. But no ending point. Scribbles take a form of circular curved lines (coil). Points which are pressing of a pencil are part of the scribbles.

They are motor enjoyable expression. These scribbles can be observed at age 2-2.11 years.

2. Distinct strokes or forms. The scribbles are continues and contains circles. The age range is 2.2-3.11 years.
3. Tadpole: It consists of a head with its features, and legs and arms as sticks attached to the head. The age is 2.11-3.5 years.
4. Transitional figure. The child draws a torso, arms and legs, but some of them are not connected to the head or the torso. The age range is 3-4.5 years.
5. Conventional figure: A child draws a distinct head with main features, torso, arm and legs. The age range is 3.10- 4.11.

It is observed that young children draw the head very large. There are two explanations for that. First, the head is the most important part of the person. Second, the children experience difficulty in planning the sizes of different parts of the body (Cox, 1993).

Cox and Parkin (1986) reported a strong correlation between the age of the child and categories. They mentioned that usually children move from one stage to another. Sometimes they mix tadpole, transitional and conventional form before they draw the conventional. Cox and Parkin indicated that the children who draw the tadpole have a mental image of the complete figure, and can segment it in a convention form, but sometimes they select not to do it. The conventional form consists of clear and separate segments of the body, and in a few occasions it is developed from tadpole. Gesell (1925) revealed that 20-49% of 4 years old children drew tadpole figures, and most of the 5 years old drew a conventional figure with head, legs arms, and torso between them (Cox & Parkin, 1986).

2.4.2.4.3 Use of the drawing of human figure

The Draw Man Test was used to identify children with emotional disturbance and children with learning problems. Shatil (1995) proposed that an appropriate time to identify young children with drawing problems is the period between 41/2- 5 years old.

Naglieri and Pfeiffer (1992) conducted a comparison study between children with conduct disorders and children with no problems. The age group was 7-17 years old. The purpose of the study was to assess emotional disturbance. They found that the test was able to discriminate between the two groups, and provide more indicators of disturbance.

McNeish and Naglieri (1993) found that the test was successful as a screening test for emotional disturbance. They detected a significant difference between normal children and those with severe emotional disturbance aged 11 years.

Kaufman and Wohl (1992) mentioned that a human figure drawing larger than 9 inches or small than 2 inches signifies that a child is immature. Albertyn (1994), Kaufman and Wohl (1992) Cox (1992), Jones (1992) and Dileo (1983) described the children who drew a small figure as either insecure, shy, with low self esteem, or experiences anxiety or depression. A child who drew a big drawing was described as insecure, defensive, with signs of aggressive, or with bully behaviour (Noqamza, 2002).

Kaufman and Wohl (1992) Cox (1992) and Golomb (1992) indicated that drawing big parts in a figure is a sign of aggression, immaturity or learning problems. Albertyn (1994) explained that frequent rubbing might refer to compulsiveness, perfection or anxiety. Broken lines might indicate insecurity. Mortenson (1991) interpreted omission of body parts (hand and arms) as a reflection of timidity, passiveness, guilt, and sexual abuse. He added that girls' drawings are different from boys' drawings. Girls tend to draw fine details, and pay attention to decoration and painting (Noqamza, 2002).

Cox and Catt (2000) worked with 88 children normal and with severe emotional disturbance. The age of the children was between 7-12 years. The drawings of the emotionally severe disturbed children were different from the drawings of the normal children. They were poor, but it does not mean that they were immature.

Matto (2002) studied 68 children whose age was in the range of 6–12 years old. These children were receiving counselling services. They used Draw-a-Man Test.

They found the test was useful in predicting internal behavioural disturbance in these children.

Other researchers did not find the test useful as a measure of personality. Kahill (1984) found no relationship between some content of the test and signs of personality disorders. Groth-Marnat and Roberts (1998) conducted a study on college students aged 18-47. They did not find a relationship between the scores of the drawing and the student's self-esteem (Terlaak, De Goede, Aleva, & Van Rijswijk, 2005).

The test also was used to locate children with learning problems. Shatil (1995) mentioned three problems that can be observed in the drawings. The first problem is low muscle tone which is a result of neurological deficiency. The symptoms of this illness are clumsiness, slowness in development, inertia in motor functioning, and slow speech. The second problem is Hyperactivity and Attention Deficit Disorder. It is also a result of neurological deficiency. The child appeared to be restless and has attention problems. He finds it difficult to concentrate, and focus on a task. The third problem is coordination and orientation in the space. A child experiences difficulty in perception and copying shapes. He lags behind his peers in drawing (Noqamza, 2002). Andreson and Thomson (1994) added a fourth problem which is retardation in the drawing. A child does not exceed scribble stage in his drawing. He has problems in gross and fine muscle skills (Noqamza, 2002)

Cox and Cotgreave (1996) compared the drawings of 18 children with mild learning difficulties and two groups of typically developed children. The first group was of the same chronological age (mean age=10.4 years) and the other of the same mental age (mean age=6 years). The number of the children in each group was the same as children with mild learning difficulties. They found significant differences between the drawings of the 6 year olds and the older children. The pattern of the development in the 6 year olds was the same, but they differed in pace.

Mti-zissi, Zafiropoulou and Bonti (1998) compared the drawings of two groups of Greek children, dyslexic and non-dyslexic. The number of children in each group was 45 and the age range was 6-9 years. The dyslexic children were low in

phonological awareness and writing. The children were asked to draw a man, a man sitting on a chair, drawing of cups placed in front of them, a tree behind a man, and a drawing of a multi colour cube. They found that the main problem in dyslexic children's drawings was lack of plan of actions. For instance, they may start from the legs, and jump to the head, and continue. They omitted some main parts such as the eyes of a person or a window in a house. The drawings lack size scale, imagination and movement. The drawings were small, and located on the bottom left or central part of the paper. The drawings indicate that the children were not secure to move in space. The children moved the paper instead of their hands. They used their fingers to draw small lines. They mentioned that orientation of the figure in the space, the space between the parts, and the sequencing in the drawings of the dyslexic children has the same pattern of development in their reading and writing. They concluded that the children's drawings could be a useful diagnostic tool for identifying children at risk of having dyslexia before they enter primary school.

Mti-zissi and Zafiropoulou (2001) explored the relationship between pre-reading and drawing skills in preschool and future reading. Their sample consisted of two groups of preschool Greek children, experimental and control. The number of children in each group was 20 and the age range was 5.7-6.3 years. The children were asked to draw the same drawings as the previous study. Also other tests such as non-verbal and non-word abilities were administered. The children were assessed on reading and writing based on National Curriculum during grades 1- 3. A significant difference was found between the two groups on the drawing of a man. The highest positive correlations were between drawing factors and phonological working memory. They explained that in drawing, a child needs visuo-spatial coding and auditory working memory. This is part of a plan of actions process. In phonological awareness such activities take place during non-word reading. Also, reading requires orientation. They concluded that there is inter-correlation between reading, writing and drawing which suggests that they are united in a semiotic system. They proposed that children's drawings at preschool could be used to identify children with learning problems in future.

Bonoti, Vlachos, and Metallidou (2005) investigated the relationship between drawing and writing in typically developed children and children with poor writing. The sample was 182 Greek children. The children's age was between 8-12 years old. For drawing, they asked the children to draw a man, a house, man inside a boat, and a tree in front of a house. For writing, they asked the children to write their full names, mother names, and copy some letters, words, and sentences. They also dictated some letters, words and sentences. They found a positive correlation between the scores of the children on drawing of human figure and a house with all writing tasks. A stronger correlation was detected between the scores of the drawing in the last two tasks and handwriting scores. It might indicate that both tasks require advance spatial skills. They need more planning and sequencing skills. They concluded that deficiency in spatial ability predicts writing problems. They mentioned that drawing can be used as a diagnostic for writing problems.

Kutschera, Tomaselli, Maurer, Mueller, and Urlesberger (2005) carried out a study on 66 children in Austria. The age of the children was between 3-7 years old. The children were divided into two groups. The experimental group had had postnatal dexamethasone treatment, and the control group had had no treatment. Draw-a-Man Test was used to measure cognitive development in the children. They found significant differences between the control and the experimental in gross and fine motor skills. The difference was for the benefit of the control group.

In summary, the previous research show that Draw a Man Test is useful in identifying young children with emotional disturbance. It is also beneficial in identifying children at risk of reading and writing problems in future.

2.4.2.5 Writing a text

This part is about writing a text. It consists of two subparts. The first subpart is on teaching young children how to write their own text. The second subpart is on some studies which used some forms of writing with children.

2.4.2.5.1 Teaching writing and children

Luckner and Isaacson (1990) suggested that teachers begin writing with children as soon as possible without waiting until they gain reading skills. They believed that

writing is more successful when it is focused on meaningful experience rather than correcting spelling, grammar and punctuation mistakes. A class teacher needs to plan for children's writing. She should think about topics which motivate the children such as trips and stores. The children must be familiar with the style. The teacher provides them a chance to select their own topic in order to initiate their interest in writing. As a start the class teacher asks the children to write a short text. She shows her interest in their writing, and values the child. If the children do not have ready topics to write on, the teacher could do a few minutes group brainstorming in order to generate some ideas. The teacher might help the children to set goals, select the audience, plan, decide the length, and the time of writing. Then, she organizes the ideas with the children.

In transcribing, the children begin to write. The teacher provides the children with feedback during and after writing. She asks some questions, discusses, suggests, probes, and helps a child to reflect, and rethink about his writing. In the revising stage, the teacher needs to focus on the positive aspect rather than the deficiency. Each time, the focus is on different aspects of writing. For instance, she might start with fluency of writing and amount of words. In this case she does not mention spelling or grammatical mistakes. Peer evaluation is very helpful. It is supposed to start with an appreciation of a child's work. They may focus on the length of the writing and discuss some unclear point. The writer could talk about his writing, and how to improve it.

Silva (1990) suggested that teachers use process writing. It consists of three stages. In the prewriting stage and writing stages, a child selects a topic, purpose of writing, and his audience. In the writing stage he selects the idea and the details. In the post writing stage, he focuses on grammar and spelling. She added that process writing focuses on the positive aspects of writing. The children are involved in a meaningful writing, and they enjoy their time. Process writing is not concerned about what is wrong.

Monteith (1991) compared grade 2 children in a traditional class and children taking process-writing program. He found that the children in the second group perceived themselves as writers. They were busy constructing their learning by thinking and

revising. They were aware of writing as a communicating skill. He revealed that process writing provides children with a positive meaningful experience, and it develops their writing.

There are a number of main products of writing. These include fluency, syntax, vocabulary, content, and convention (Luckner, & Isaacson, 1990; Gregg, & Mather, 2002). In fluency, the purpose is to encourage the children just to write. The focus is on writing words, phrases, and simple sentences without paying attention to correction. In syntax, the focus is on teaching the children some sentences with one word missing, and to ask the children to say the word. In content, the teacher helps the children to write better during planning and revision time. The children could discuss a piece of writing using charts. They may suggest a topic sentence and a closing sentence. Then, they ask for two sentences in the middle. In convention, comments could be on spelling, punctuation and handwriting. It is important not to focus on this aspect at any early stage.

2.4.2.5.2 Writing a personal letter and young children

Some researchers used a personal letter to study young children writings. Zecker (1996) conducted a study on 40 children in preschool and grade 1. The purpose of her study was to investigate the children's knowledge in writing stories, a personal letter, and a shopping list in English. She used these types of writings because they have a purpose. For scoring, she developed her own scale from Sulzby's categories of writing system (Sulzby et al. 1989). These were drawing, scribbling/letter like forms, letter string, copying, invented spelling/combined invented spelling and convention writing and others. After writing, the child was asked to read what he wrote. Then, the stories were classified into narrative, all about (expository), mixed text, one word/ sentence, and other classification.

A letter was considered a personal letter if it contained a message sent to a personal address. It included similar categories to stories as one word/sentence, mixed, and others. The shopping lists were classified as list like if they contained some items which were presented and organized in series, an inventory of semantically related words in addition to narrative and all about as in the personal letter. Zecker found the

personal letter and the story were related to conventional writing more than the shopping list. Grade 1 children employed more conventional writing than the preschool children. With time, both groups showed more progress in convention. Reading of the writing showed the style of writing that had been used. However, reading the list was the best in both groups from the start. With time the children added an introduction to the list such as "This is what I will buy". She found mismatch between psychosocial and perceptual symbolic aspects. The list seemed to be difficult because it contained complex unfamiliar items, but not difficult in composition compared with the other types. Grade 1 children used more drawing in the list. The letter and the story contain lots of words which the children knew such as "Dear love" names. The two types of writing encouraged children to invent words. This indicated that the children were flexible in the use of words based on the task demand.

Re, Caeran, and Cornoldi, (2008) used writing a letter to compare two groups of children on writing. The first group was diagnosed as having Attention Deficit Hyperactivity Disorder (ADHD) symptoms and the other group was normal children. The sample size was 35 Italian children in each group. The mean age of the children was 9.2 years. The children were selected from grades 3, 4, and 5. The children were asked to write two letters to French twins who were planning to move to Italy. In the first letter the children described how they spend their free time. In the second letter, they described their town. The children wrote the two letters under two conditions. In the first condition, they wrote the letter with no support (CF). In the other condition, they had a guide scheme on how to write the letter (CFW). The children had one hour training before the study in order to be familiar with the tasks.

The researchers used four criteria to score the writings. The first one was adequacy. It refers to the extent a written text fits with the requirements of the text. The second was structure. It refers to the organization of the text. The third was vocabulary. It included the number of words, and how appropriately are they used. The fourth was grammar. It included things such as tense, number of nouns, verbs, adjective, and punctuations. They observed improvement in both groups after the training. They found a significant difference between the two groups in writing skills. Both groups

wrote more during (CF) than (CWF). They produced more ideas. They concluded that writing a letter is useful in identifying children with writing problems.

In conclusion, drawing human figure, copying shapes, and writing require an internal model. They need visual motor skills. When children write words they use their drawing and copying shapes skills. The children need a model of the symbols. They do planning. They understand part whole relationship. They need appropriate fine motor skills in order to transfer the ideas to paper. The difference is in drawing or copying lines are bounded together; whereas writing is based on the rules of convention unites and notation.

2.4.2.6 Development of children and geometric shapes

This section consists of four parts. The first part is a brief explanation on the process of copying shapes in young children. The second part describes the research on vertical, horizontal, and oblique. The third part is on the aspects that are involved in accurate copying of shapes. The fourth part is on copying diamond shape and writing problems in young children.

2.4.2.6.1 The process of copying shapes in young children

Young children follow general steps in copying shapes. In the beginning, visual perception is important in learning about shapes. Young children distinguish between shapes. A child could differentiate between a square and diamond by the age of 2. However, it is not the case in copying (Maccoby & Bee, 1965, Bee & Walker, 1968). Piaget and Inhelider (1956) indicated that when a child is asked to copy a figure he does not copy it directly from the external model, but he copies it from his schema of the model (Maccoby & Bee, 1965). They argued (Maccoby & Bee, 1965:371): " *the child's first schema are not distinguished on the basis of such Euclidean criteria as straight lines versus curves, or the size of angles, but rather on the basis of topology*". Based on topology, the children view a closed circle, square, triangle, and diamond as a simple circle. According to normative data from the Standford Binet test, a child copies a circle at 3 years, a square at 5 years, and a diamond at 7 years (Maccoby & Bee, 1965; Berman, Cunningham, & Harkulich, 1974).

Feder (2007) reported that Beery and Buktenica (1989) observed the following in young children:

At age 2, children begin to draw a vertical stroke.

At age 2.6 years, they draw a horizontal stroke.

At 3 years, they draw a circle.

At 4 years, they copy a cross.

At 5-6 years, they copy a triangle.

He added that copying oblique is a sign of writing readiness.

Laszlo and Bairstow (1985) indicated when a child looks at visual stimulus such as a shape he holds the model he expects to copy and examines it. He internalizes the information before he starts drawing. He observes the materials he is going to use in his drawing such as a pencil and paper. Then, he orients himself, and finds the correct position of his body in order to copy the model.

On the other hand, the child retrieves his previous experiences in copying shapes that were stored in this memory. He evaluates the situation. Then, he develops an action plan that begins with the starting point. He determines what to do and the direction of movement. He estimates the force needed on the pencil and the amount of pencil pressure on the paper. Then, he controls the speed of movement during drawing. This plan will be programmed. Then, the part of the brain that monitors the motor system takes over. This part selects the motor units required. Then, the child begins to copy the shape.

In summary, it is important that the child reaches a certain age in order to copy a particular shape. However, it is not a must. When a child is exposed to a shape, he explores it, and compares it with the knowledge in his memory. He retrieves the information, and develops a plan of action. He uses his motor skills, and integrates the shape in serial into the paper.

2.4.2.6.2 Views in copying shapes

Some researchers introduce different views in order to explain copying shapes in young children.

2.4.2.6.2.1 Internal model

Piaget and Inhelider (1956) indicated a child copies a shape from an internal image he had from previous experience, and he does not copy the model placed in front of him. Maccoby and Bee (1965) introduced the idea of object constancy. According to this view, the child perceives the stimulus in front of him, as a familiar object. Therefore, he just focuses on the similarities, and does not pay attention to the differences. Gibson (1950) indicated that object constancy depends on the use of cues in the context. For instance, in one occasion an ellipse is viewed as a tilted circle, and in another situation as an ellipse (Maccoby and Bee, 1965).

In summary, a child sees a model in front of him. He collects some information about it. It is important to know that what is important to one child is not for another. He compares this information with his previous knowledge in the memory. He selects the internal model that shares some aspects with the new information he knows. Then, the child draws this internal model.

2.4.2.6.2.2 Rules of copying shapes

Following rules is important in copying shapes. Goodnow (1972) and Goodnow and Levine (1973) indicated that children find it more difficult to copy a diamond shape than a square shape because these children are confused about rules for copying the diamond. These are to start at a top most point, and start at a leftmost point. Goodson (1967) and Brittain (1969) found that children do show more improvement in their copying after they have enrolled in discrimination training. Bee and Walker (1968) and Birch and Lefford (1969) observed no link between discrimination of a model and copying movement. Olson (1968) observed that teaching children drawing rules improves their skills in diagonal copying. It seems that following the rules makes the

child internally aware of the details, and this could help to a certain extent in discrimination of the oblique (Naeli & Harris, 1976).

2.4.2.6.2.3 Part and whole relationship

Copying a shape needs sequential strategies. Children are supposed to split the whole task into segments. They are required to recognize the relationship between the segments and the whole. They need to learn how to reconstruct this connection. Some children cannot produce an appropriate copy because they cannot identify the common elements in the model (Maccoby, 1968).

Rand (1973) found that preschool children's (3-5 years) deficiency in copying models is not related to their inability to analyze the model they are supposed to copy, but it is linked to their inability to reconstruct the relationship between the segments and the whole. He mentioned that the children who had had training in drawing rules did improve in copying function, but no improvement was observed in their discrimination function.

On the other hand, children who had visual analysis training showed improvement in their discrimination skills, but they did not do well in copying. He added that the children who had drawing rules, learnt how to plan their drawing, and can identify the outline of the drawing, but they were not able to organize the space without dots. He (Rand, 1973: 52) said: "*In fact, improvement in discrimination ability was related to decreased copying accuracy*". He claimed that children require both appropriate visual analysis and use of drawing rules in order to produce correct copying. The first supports the children to identify the details of the task, and the second guides them to reconstruct the relationship between the details. They concluded that (1973: 47): "*Drawing rules are essential and adequate visual analysis is a necessary but not sufficient prerequisite to the production of accurate copies*".

Kaspar and Schulman (1964) indicated that the children who draw ears or wings on the horizontal angles of a diamond lack the ability to perceive part whole relationship (gestalt) of the diamond figure (Kaspar & Schlman, 1964).

In summary, part whole relationship is important for integrating the internal model on a paper. It is possible that the children learn that with maturation and frequent experiences.

2.4.2.6.2.4 Vertical effect and external cues in copying shapes

Children use external cues when they copy shapes. Olson (1970) asked 3-5 years children to draw vertical, horizontal, and oblique on circular and square boards. He found that children's error in vertical and horizontal on both circular and square boards were fewer than that on the oblique board. On the oblique the errors on the circular board were less than those on the square. It is possible that, in the first case, the child was confused between the vertical, horizontal, and oblique, and in the second case the external effect is more controlled, and perhaps the differences between the three lines are reduced.

Bryant (1974: 71) stated that: "*an essential feature for discrimination of line orientation is whether the line is parallel to features of the background*". This is the core concept of match mismatch strategy that was introduced by Bryant (1969, 1973, and 1974). He argued that children use the surrounding frame for orientation coding. For instance, if we have three lines, horizontal, vertical and oblique, which are placed on a rectangular card, a match between the edges of the rectangle, the vertical and horizontal line is obtained. But in the case of the oblique no parallel lines are present, so the left and right oblique produce mismatch signal mismatch signal which makes it hard to distinguish between the two oblique (Williamson & McKenzie, 1979). This means that the child can draw the line which is parallel to a line in his context. Bryant mentioned that children find it easier to draw both vertical and horizontal lines, because their surroundings are full of these lines. These lines represent cues for them. They found it is easier to draw a diamond shape on a diamond paper. It is assumed that the child could draw oblique lines parallel to the edges of the paper which are oblique in this case.

Ibbotson and Bryant (1976) mentioned that it was documented that, under some conditions, young children experience difficulties in copying vertical and horizontal lines (Mackay et al, 1972; Liben, 1974, Thomas & Jamison, 1975). They noted that

children under 7 years cannot draw a horizontal, like the horizontal level of liquid in a tilted bottle or glass. It is also difficult for them to draw vertical like vertical trees. But, if the line which they have to draw is perpendicular to the baseline that might itself be vertical or horizontal, the same children draw the horizontal level of liquid, and the vertical tree correctly. This means that the children have a problem in drawing non-perpendicular lines and oblique. Ibbotson, Bryant (1976) raised some questions. First, is the difficulty only restricted with paper and pencil copying? Second, do children lack understanding of spatial relationship? If yes, the motor control factor should be excluded.

Ibbotson and Bryant (1976) conducted three experiments. In the first experiment, the questions are: Is the error size with the vertical and horizontal line the same as with the oblique? The child was asked to copy a model made of a 6 inches baseline and from the middle it is attached to a 4 inches small line. This small line was either at a right angle (90 degree) or acute (45 degree) angle with the baseline. The baseline was vertical, horizontal or oblique. They used 24 figures, six for each type of baseline (vertical, horizontal or oblique). Each six were made up of two perpendicular figures with the short line left- right or up down. The other four were the 45 degree angles which were located in the same direction as the 90 degree. They found that children copied the 90 degree angles with vertical and horizontal baseline more accurately that the 45 degree angles. This means that the baseline has an effect on copying the lines. They also found (Ibbotson & Bryant, 1976:321): " *the perpendicular error occurs, but, although it is quite strong with the horizontal and oblique baselines it is hardly detectable when the baseline is vertical*". They called this vertical effect.

In their second experiment, Ibbotson and Bryant (1976) wanted to study the vertical effect across various age groups and not only with young children. They had a sample of forty children. Half of them were in the range of 3 years and 3 months to 4 years and 6 months. The other group age was in the range of 4.8 to 6.10 years. They used the same 24 figures, but the shorter line was 3 inches and the cards were inches square. The stimulus figure was only vertical and the card on which the children copied shapes was horizontal and much closed to the vertical stimulus. The children were asked to copy the figures, and to lay down a wire on the drawing card against

the baseline. The experimenter measured the angle made up with the wire. They concluded that the vertical effect was present during the two motor responses.

In the third experiment, Ibbotson and Bryant's (1976) aim was to make a generalization of the vertical effect with different figures. Therefore, they used a rectangle with a line which was drawn across it. The sample was the same as in experiment 2. They used 12 rectangles, four were vertical, four horizontal and the remaining four were oblique. The children were asked to copy the line which joined the two longer sides. Half of these lines were perpendicular and the other half were at 45 degrees angles with the sides of the rectangle. It was found that the perpendicular figures were easier to be copied that the non-perpendicular. In this experiment it was confirmed that the vertical effect is present.

In summary, Ibbotson and Bryant (1976) stated that children are surrounded by vertical and horizontal lines. They believe that children use these lines as their external framework. Also, they think children have a postural sense of vertical which they use as an internal framework. When the verticals in both the external and internal framework are only together, the vertical line (midline) becomes stronger, and more distinguished for children. However, they agreed with Witkin (1962) that, if young children lack the vertical line in their external context, the vertical line loses its quality as a strong cue in children's surroundings. They argued that in case this idea is correct, children consider the vertical line as a reference point when they organize their experience in the space. They work with spatial problems in relation to vertical. They argued that there is evidence that, children find it harder to draw an angle of 45 degree than a perpendicular angle. Harris, De Tendre and Bishop (1974) reached similar conclusions in their study with 18 primary school children aged 4.10 -5.4 years old.

Berman, Cunningham and Harkulich (1974) found that young children draw lines of different orientation based on their immediate memory. In one of their research studies, they asked preschool children to draw horizontal, vertical, and oblique lines on a circular frame. They discovered that in terms of accuracy, the children's copy of the vertical line was more accurate than the horizontal and oblique. There was a slight difference between the horizontal and the oblique. This means that the absence

of immediate vertical and horizontal cues reduced the differences between horizontal and oblique in the circular frame. The researchers concluded that children use horizontal and vertical cues in their immediate context such as the shape of the frame and the rectangle table. In the case of the oblique, usually there are no immediate cues in the environment.

Berman et al (1974) mentioned that the results of the vertical and the horizontal lines could explain that the children were centred on the immediate context which included more square and rectangle things. They claimed that if the presence of a rectangular frame in the immediate context was the main cause of children's difficulties on drawing the oblique, the previous mentioned results of Olson, in which he indicated that the oblique errors were less in a circular frame, make sense. Berman et al (1974) tried to eliminate the linear cues in the immediate context. However, still they observed that the children performed better on vertical and horizontal. Berman et al (1974: 477) said: "In *the absence of horizontal and vertical reference axes in the immediate surrounding children apparently relied on body cues. In particular, the midline seems to be a powerful cue for spatial judgments with the vertical constructed as an extension of the midline*". They found that young children experienced difficulty copying both horizontal and oblique in comparison to the older children who copied the horizontal much easier than the oblique. Developmentally, children copy first vertical, then horizontal, and at the end the oblique. Berman et al (1974: 477) said "*Children may decenter as they develop and they may then use the distal cues for the horizontal which are usually more available that oblique*". They mentioned that it is possible that children set up a vertical axis through using vertical cues. Then, they use the horizontal cues to create the horizontal axis in a perpendicular direction to the vertical.

Berman (1976) studied children's drawings of the vertical, the horizontal and oblique lines on a square background. She observed no differences between vertical and horizontal lines. This means that children on the horizontal drawing benefited from the square frame. However, the oblique was less accurate.

Naeli and Harris (1976) examined the effect of the external frame on children's copying of a diamond and a square. In the first experiment, they asked the children to

copy a diamond and a square in circular, diamond, and square frames. The children's copying of the square was more accurate on the square frame than that on the diamond frame. Also, children's copy of the diamond shape was more accurate on the diamond frame than that on the square frame. They proved that children's difficulties in copying a square and diamond shape are caused by the frame shape (the paper they draw on). Naeli and Harris (1976) criticized Gibson's (1969) hypothesis of the visual discrimination of the two oblique shapes (mentioned above). They mentioned that if the children are able to copy the diamond shape on the diamond frame, they are able to discriminate between obliques. It is possible that this is based on previously mentioned findings that children discriminate between shapes at an earlier stage than copying shapes. Also, they rejected Abercrombie's (1970) hypothesis of motor factor involvement, and proved that the children in their study were able to draw oblique (Naeli & Harris, 1976).

On the other hand, Naeli and Harris (1976) argued against Goodnow and Levine's claim. They mentioned that if the children could not distinguish between the two rules, it means that they did not understand the instruction, and they copied the frame instead of the model. This might be acceptable in the cases of the diamond and square, but in the case of the circular frame, they mentioned that there is no incident of drawing circles. They added that this result agreed with Piaget and Inhelder (1956), finding that children find it easier to draw a straight line parallel to the frame. At the same time, saying this might create doubt about the accuracy of drawing a straight line in a circular frame. Therefore, Naeli and Harris (1976) performed on a second experiment to clarify this point.

In the second experiment of the research, Naeli and Harris's (1976) focus was on the orientation of square and diamond in relation to the square, diamond, and circular frames. They used the three frames (square, diamond and circular), and two black cardboard models of diamond, and square shapes. They placed each model in a central position at a fixed distance of 2 inch from the topmost point of the frame of the same type of each shape. Then, a circular plate was placed flat in front of the child, and in a central position in relation to the child's body. This means that the imaginary diameter of the circular plate passes through both the centre of the model

and the frame. This diameter forms a right angle with the child's mid frontal body. The child was provided with a similar model of a square, and a diamond in size, and materials. Then, the demonstrator says: "here is my card (pointing to the black model) and here is yours (pointing to the black card lying on the table in front of the child). Put your card here (pointing inside the frame and make it look the same as mine". After the child placed the card, the position was marked.

Naeli and Harris found that the deviation between the position of the model and the child's card is the child error score for each model frame combination. It was found that there was less error when the child put the square model inside the square frame than that when he put the square model in the diamond frame. Also, the error was smaller when the child placed the diamond model in the diamond frame than when he placed the diamond model in the square frame. It was found that placing the square in the circular frame was more correct than the diamond. They observed that the square is oriented more accurately than the diamond when it is presented first. The difference in orientation is reduced when the diamond was introduced first. They explained that after the child placed the square, (Naeli & Harris, 1976:76) *"he tilted the diamond in the direction of the square"* and after the child placed the diamond *"he tilted the square in the direction of the diamond"*. They said (Naeli & Harris, 1976:76): *"the positioning of the square was typically more accurate that positioning of the diamond, but this superiority disappeared when the square was placed within non matching diamond frame"*. They also, indicated that the effect of the frame is not limited to drawing with a pencil on a paper, but also can be seen when placing the three-dimensional shapes in the frame.

Naeli and Harris considered two findings in order to draw a conclusion from their research. The first one was Gibson's finding of children's perceptions of the orientation of the same shapes as equivalent. The second was Bryant's (1974) finding of immediate environmental cues effecting the orientation of the drawing. They indicated that the children perceived the outline of the model shape but did not grasp its orientation. The children placed their copying of the model in alignment with the orientation of the immediate cues. In this case, the children encoded the straight-line parallel in the frame. If the cues were removed as in the circular frame, still the

influence of the vertical and horizontal lines orientation might be present to a less extent. Naeli and Harris (1976:77) said: *"This bias would explain the greater accuracy in placing and drawing the square versus the diamond in the circular frame"*. They add (Naeli and Harris, 1976:77): *"We have shown that the diamond is not more difficult to copy because of lack of motor, or confusion of oblique, or vulnerability to conflict in drawing rules. The relative difficulty of making a copy is, however clearly influenced by the frame within which that copy is made"* This study of Naeli and Harris (1976) was repeated by Freeman, Chen and Hambly, (1984). They asked 5 years old children to draw a square and diamond on square and diamond papers. They found, that the shape of the paper which the children drew on was the factor responsible for the difference, and not the model.

In summary, young children use immediate cues in their context to copy a shape. A vertical line acts as a reference for copying. Children find it easier to copy vertical and horizontal lines than oblique. It is important to mention that the age of the children in these studies was under 7 years.

2.4.2.6.2.5 Child development

Young children vary in their development. Development includes physical, cognitive, emotional and social areas. Naeli and Harris (1976) reported that an average typically developed child is able to copy a diamond shape at 7 (Cratty, 1977; Arnheim, 1954; Piaget & Inhelder, 1956). Broderick and Laszlo (1987) found that oblique lines in a diamond shape require more advanced motor programming than vertical and horizontal, as in the case of square. They think that combining the oblique lines to form a diamond needs more planning than the other lines. They interpreted the difference in the groups (5 to 12, and adult) as a spatial programming and planning ability which is a developmental factor in younger children.

Gibson (1962) observed that five years old children deal with "two orientation of the same shapes as equivalent" (Naeli & Harris, 1976: 76). Gibson (1969) claimed that young children experience difficulties in drawing a diamond shape because the diamond needs visual discrimination between oblique.

In summary the pace of the development in young children is an important element in copying the diamond shape. It is linked to part whole relationship which helps the children in planning and transferring the model to the paper.

In conclusion, the internal model, part whole relationship, external cues, and child development are important in copying a shape. I think they vary in the extent of importance from one child to another. Other factors such as emotion might also be involved.

2.4.2.6.3 Accuracy in copying of shapes

There are three reasons for inaccuracy in the drawing. First, the amount of information on a particular task available in the brain is important. Each child pays attention to different aspects of the shape. Some children are not stimulated enough when they are asked to look at a shape and copy it. They do not give themselves enough time to explore the shape, so the information which reaches the brain is not complete. The other point is the speed of retrieving this information when it is needed. It is crucial that this information is retrieved at the same time as hand movement or drawing. A child's previous experience or kinaesthetic skill could affect motor program and the quality of copying (Braswell, Rosengren, & Pierroutsakos, 2007).

The second reason is a deficiency in programming ability. The efficiency in selection of motor units grows with age and practice on task (Braswell, et al., 2007). A child develops a mature grip configuration around age 6 (Rosenbloom & Horton 1971; Saida & Miyashita, 1979). At this stage, the child uses tripod grip. He holds the pencil firmly between the thumb and the pointer and middle finger. Martlew (1992) found that stability in grip configuration in 4- 5 years old children results in a higher quality of letter production than in children who used various grips. The demand of the drawing could lead the child to change the grip. Some children vary in their grips in the same drawing or they use different grips to begin various tasks then they shift to another grip depending on the demands of the task (Braswell, et al, 2007).

Braswell et al (2007) found in their study of 18 preschool children, whose aged was between 37-50 months that the children who used more than one grip in coping

simple shapes, were less accurate than the children who used only one grip. These children might be at a transitional state, and after a while they will develop a preferred grip (Greer & Lockman, 1998). Other children, who have more practice in drawing, move to a power grip (Blo¨te & Heijden, 1988; Blo¨te, Zielstra, & Zoetewey, 1987). As grip configuration becomes stable, children develop full control on motor movement. The third reason that might affect motor function is the materials. For instance, a child might be used to drawing with a special type of pencil, and changing pencil might have a negative effect on his finger movements. When such error is detected, the brain sends instructions to motor programming to correct the error (Freeman & Cox, 1985). Grip configuration has an important function in the initial stage of drawing or writing (Braswell, et al, 2007).

Fourth, the child needs appropriate visual analysis and motor or graphic skills to draw. First, the child begins to draw from the top of the figure, and maybe from the left. For instance, when the child draws a cross, he starts with the vertical stroke from top to bottom. Then, he draws the horizontal stroke from left to right. The second rule is threading. The child draws the outline of the figure from the beginning to the end without lifting the pencil. For instance, to draw a square the child begins from the top-left, and continues in a clockwise direction until finished. In the square, there are two rules. The first is top-left to draw the upper horizontal line, and then top-down to draw the right vertical line. This rule can be used to write number 7. The other rule is to begin from upper left. He moves the pencil top-bottom to draw the left vertical line then left right to draw the bottom horizontal line. This rule can be used to write the letter L. The third rule is to combine these two rules. Also, it is easier to copy the shape if it is located on the top of the page than in a side-by-side location. He can draw his shape beneath it (Bryant, 1974; Anwer, & Mermelin, 1982 in Cox, 1992).

In summary, sending complete information about a shape to the brain is important. Flexible grip configuration is needed. Appropriate visual analysis and graphic skills are required. This includes part whole relationship. It is necessary that the pace of retrieving the information is adequate with the motor movement of the hand

In conclusion, all of the above aspects explain the requirements for copying shapes. These are important in writing. A child needs a model of the symbols and words. He needs ideas and a plan. It is important that he understands the part whole relationship and the rules of the print before he starts writing. Flexible hand movement enhances writing.

2.4.2.6.4 Copying diamond shape and writing problems

Weil and Amundson (1994) used the Developmental Test of Visual–Motor Integration (VMI) which included the oblique cross to study writing development in 60 developed preschool children. They found an association between copying oblique and writing letters. They mentioned that the tools can be used to identify the children at risk of handwriting problems. Marr and Cermak (2001) used the same test to study 101 children, and observed that oblique lines predicted handwriting in grade 1. They observed more association with female handwriting success than males.

2.5 Numeracy

This part consists of three subparts. The first subpart describes the development of numbers in children before they go to school. The second subpart is on counting theories. The third subpart is on the stages of early arithmetic learning.

2.5.1 Development of numbers in children before school

Mathematical competency starts before joining school (Krajewski & Schneider, 2008; Butterworth, 2005; LeFvre et al, 2006). Children play with toys. They place pieces on each other. They arrange their cars or dolls in a row based on size, colour, and other criteria. They count them. They know their birth date. They count the money which they get from their parents and others. Some children plan how to spend this money. Nowadays, some children switch T.V channels to find their favourites. They know which channel comes before and after their favourite channel. They look at the clock on the wall waiting for some events, and they keep asking "what is the time now"? They play with electronic games. They use counting when they play with other children. They hear people using numbers, and they learn from them how to count. Also, numbers are used in nursery rhymes and storybooks.

Children are born with the ability to discriminate between quantities (Antell & Keating, 1983; Bijeljac-Babic, Bertoncini, & Mehler, 1993; Huntley-Fenner & Cannon, 2000; Starkey & Cooper, 1980; Wynn, 1992; Xu, Spelke, & Goddard, 2005). Jordan and Levine (2009) called this ability preverbal number knowledge. It helps the child to represent quantity without using verbal symbols. According to the developmental theory, a child starts with two systems for number representation. The first system is object file which is responsible for a precise representation of a small number of items. The other system is analogue magnitude which is for approximate representation of large sets of items. These two cores are shared by people from various cultures. They are the basis for later mathematical learning.

Starkey and Cooper (1980) observed children 4-7.5 months discriminated two items from three items. Strauss and Curtis (1984) reached the same results with 10-12 month children. They added that some children were able to discriminate three items from four items (Geary, 2006).

Wynn (1992) found that 5 months old infants develop implicit understanding of arithmetic problems. They comprehend that addition means an increase in the quantity, and subtraction is a decrease in the quantity. She observed that the children know that one item + one item = two items (Wynn, 1992; Geary, 2006). She indicated that infants do that before saying their first word. Some researchers found similar findings in both addition and subtraction (Cohen & Marks, 2002; Simon, Hespos & Rochat, 1995; Wynn & Chiang, 1998). Others failed to replicate Wynn findings (Wakeley, Rivera, & Langer, 2002). Some researcher indicated that factors other than arithmetic competency might be involved in Wynn's findings (Cohen & Marks, 2002; Simon at al., 1995 in Geary, 2006).

When young children learn language, they learn terms such as big, small, little, less, lots, and the same which are used to describe quantities. Resnick (1989) introduced three proto- quantitative schemas that children need to learn. First, children compare two quantities by vision and say if a quantity is bigger than or more than another. Later they compare between the two quantities, and judge whether one quantity decreased/increased or stayed the same (Krajewski & Schneider, 2008). Resnick (1989) believed that this schema is important for development of future maths. They

formed with counting the foundation for learning some principles in maths (Gersten et al, 2005; Okamoto & Case, 1996 in Krajewski & Schneider, 2008).

Toddlers could compare between sizes of small groups and are able to use terms such as more, same, and different in this comparison (Wagner & Walters, 1982). In addition, they might use counting language, but not necessarily in the right counting order. Children at this age could differentiate between counting and non-counting words, and are able to use the former in counting objects (Fuson et al, 1982 in Jordan & Levine, 2009).

At around 2 years, children learn to count, but they cannot use a number word to describe a quantity. They need to perceive the number word as a discrete word, and recite the number words in their appropriate sequence (Fuson, 1988). Children learn the exact number word sequence with more experience in counting. They become aware that a countable quantity is not assigned to the last number. They understand that the duration of number words is corresponded with the discrete quantity. Number word sequence is important for learning the cardinal value. The cardinal value is the largest number word in a set of objects. Children learn cardinality between 3- 5 years old. They use subitising or counting to determine the cardinal value of a set. In counting, children learn number word sequence to get the cardinal value. They use forward number word sequence by using counting all, counting from one, and counting on. They use back word number word sequence by counting down to or from. They learn the meaning of number word sequence by mapping the number word to the preverbal magnitude (Benoit, Lehalle, & Jouen, 2004; Bermejo, Moralesb, & deOsunac, 1997). In either conventional forward or back word number word counting in sequence the last number is the cardinal value.

Gelman and Gallistel (1986), observed that children age 2-4, were able to count objects in a row by given each a counting word (Smith, 1997). Gelman and Gallistel (1986) mentioned that Beckmann and Descoeudres (1920s) indicated that children were consistent and accurate in their recognition of small quantities of one, two and three. They introduced the term subitising. It refers to children's ability to identify a small quantity, and saying how many without counting. Piaget and Backmann viewed this term differently. The first scholar mentioned that children look at the

small quantities as a pattern that is different from the previous one and named as three (Baroody, 1987 in Smith, 2002). It seems that children are only able to assign a name for a quantity and did not develop understanding of numbers. It is assumed that children will be able to do that at an operational stage. The other scholar claimed that children do counting (how many in a group) before subitising. Both views considered subitising as an important step in understanding numbers (Baroody, 1987), and assumed that it is a start for generalization (Smith, 2002).

Wynn (1990, 1992) found that children age 3 can say the number word sequence until 6. After a few months they learn the meaning of these number words. At the end of year 4, children reach mastery in the meaning of small number words. They can recite the number word from 1 to around 20. After one year they recite higher number word sequences, and they map number words to objects.

At the end of reception stage, or at 4 years old in nursery class, a child is expected to say and use number names in order, in a familiar context. In addition, he is supposed to count up to 10 everyday objects. He expected to use maths in ideas and strategies to solve problems (Smith, 2002). At age 5, the child begins counting from one, and he counts each item only once. At this time, he understands that the last number in counting tells the set size (Jordan & Levine, 2009; Ansari et al., 2003).

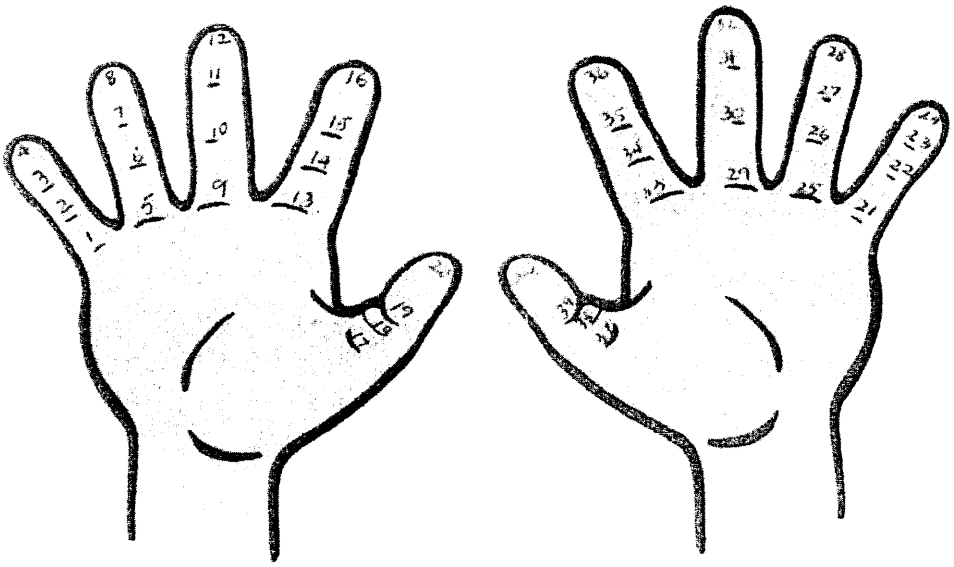
Reciting number word sequence skill was found to be a powerful predictor for solving arithmetic problems. Pollio and Whitacre (1970) found that the association between saying a forward number word sequence and splitting objects into equal sets is a strong predictor. Secada, Fuson and Hall (1983) found that counting on strategy in addition depends on counting forward from a certain point on the number word sequence. Ho and Fusson (1998) observed that forward number word sequence is important for a simple addition task and understanding counting in teens. Wigforss (1946:19) said: "*The little respect that many teachers seem to give to the importance of the child's ability to recite the number word is evidently unfounded*".

Okamoto and Case (1996) found that the link between counting and quantity discrimination in preschool predicts future achievement in maths (Gersten, Jordan, & Flojo, 2005). They claimed that these abilities are not given enough attention in

motor case, he raises 5 fingers and he moves each finger, and says a number word until he finishes all. In verbal counting, the child after counting from 1 to 9, he says 4 and one more is 5, and so on until he finishes the 5 items. The verbal type is the most advanced strategy. This child is said to be in late stage 2 (Wright et al, 2006).

In India (Guha, 2006), the child counts three lines in each finger, and he adds the tip of the finger as the fourth. He starts from the bottom of the index in his left hand, and continues to the thumb. Then, he moves to the bottom of the thumb in the right hand, and continues counting until he reaches the bottom of the index finger in this hand. The total counting in both hands is 40.

Figure 2-1 shows Indian's children use of finger pattern in their counting



2.5.3.4 Stage (3): Initial number sequence

The child uses counting on strategy to solve addition or missing addend tasks. It is possible that some children use counting down from, but not counting down to. For instance, 14-3 is 13, 12, 11, and the answer is 11 but not 3. The child at stage three might use one or more of counting by ones, counting up from, counting up to, and counting down from. In solving additive tasks, the child uses counting up from (counting on) the first collection or larger addend. Some children could use counting on strategy in the range 1 to 100. The child could keep track of 6 or more items in the

second collection. Before counting, he anticipates that he could keep track of the required counts. These two criteria are signs of this stage.

The child also, use counting on strategy when he has to solve missing addend using two screened collections of counters such as 6+ ... = 9. At the same period, the child develops counting down from to solve subtraction tasks which involve a small known difference. The child can say a forward number word sequence in the range 1 to 100 or beyond. The child can say a backward number word in the range 30 to 1, possiblely100. At this stage, the child recognizes all the numerals in the range 1 to 100, but might have reversal problems. He could name some 3 digits numerals, but might have problems with the number that has zero such as 204 and 430.

The child might count forward and backward by tens or decade (10, 20, 30, 40, and on). It is difficult for him to do off decade such as 2, 12, 22, 32...and so on. In tasks which include tens and ones, the child could do increment by tens, but not the ones. When he has to do increment by tens and off decades or by tens and ones, he might use counting one by one or he makes errors. The child at this stage might have some knowledge of multiplication and division. He can combine equal groups, equal sets, and arrays.

2.5.3.5 Stage (4): Intermediate number sequence

The child uses countdown to solve missing subtrahend task. This is a more advanced strategy than other counting by ones strategies. For instance, in task such as 15-12, the child says 14, 13, 12 and the answer is 3. In other aspects such as FNWS, BNWS, numeral identification and others, they are similar to the child in stage 3.

2.5.3.6 Stage (5): Facile number sequence

The child uses noncounting by ones strategies to solve addition and subtraction problems. He uses strategies such as compensation, tens, doubles and others. For instance, a child uses his knowledge of 10+ 5 to solve 15-11, 38+4. At this stage the child finds it easy to say FNWS and BNWS in the range 1 to100 and beyond. He can identify numerals in the same range. He can count by twos, threes, fours, fives and tens. The child can do increment and decrement by tens on and off decade in the range 1- 100. He could do the same in tens and ones. The child is able to solve

multiplication and division tasks which involve screened equal groups or arrays by using skip counting, repeated addition or subtraction (Wright, et al, 2006).

2.5.4 Link among reading, writing and numeracy

Children learn reading, writing, and numeracy during social interaction. Oral language is important for learning, reading, writing and maths. Children, in their daily contact, use meaningful words which include number words. Reading, writing, and numbers share print. Children need to learn numbers and letters in order to interact with print. In reading they link numbers to quantities and letters to sounds. They recite letter and numbers in sequence, and they are important for reading and solving arithmetic problems. In reading, writing and numeracy, children need to have previous information or an internal model of symbols and objects. They need to understand part whole relationship; also, they require spatial knowledge. However, letters found in print form, but this is not the case with numbers. A digit has a meaning, but a letter has no meaning alone.

2.6 Children and coping

Coping is a dynamic cognitive and behaviour effort that a person develops in order to deal with the demands of an external and internal encounter that was appraised as exceeding his personal recourses (Lazarus & Folkman, 1984). The definition focus is on what the person can do in a stressful situation to mange, and create stability more than changing the situation. The definition places emphasis that coping is contextual related. It means that the personality of the person involved, situation, and the way the person evaluated it and the availability of resources determine the demand of coping for that particular context. Another point is the definition emphasizes that coping is an effort. It means that it is difficult to decide that a certain coping strategy is good or bad before using it. It is possible that a person finds a coping strategy useful or not useful.

This section deals with children's use of coping strategies in order to deal with stress. The first part describes development of emotion regulation in young children. The second part provides a review of some scales and approached which were used to assess coping in young children. The third part explains the way children cope with

stress in different in medical, social and classroom contexts. The fourth part focuses on the importance of the educational environment in reducing negative coping strategies which has an influence on pupils' academic achievements.

2.6.1 Emotion regulation before school

This part is on emotion regulation before school. It is composed of three subparts. The first subpart is on the development of emotion regulation. The second subpart is on the mother's role in the children's emotion regulation. The third subpart is on the effect of emotion regulation on the child's academic achievement in the school.

2.6.1.1 Development of emotion regulation before school

Emotion regulation can be defined as the ability to control the expression, and experience of emotions (e.g., Campos, Campos, & Barrett, 1989; Cole, 1986, Fallin, Wallinga & Coleman, 2001). Children are born with a repertoire of emotions (Bridges, 1932; Campos et al., 1983; Emde, Gaensbauer, & Harmon, 1976; Izard, 1977; Lewis & Brooks-Gunn, 1979; Lewis & Michalson, 1983; Sander, 1962; Spitz, 1965; Sroufe, 1979). These emotions are called "feeling states" and include physical discomfort, hunger, and experience of pain. In the first few days of life, emotion regulation begins with turning the head, and sucking fingers. Emotion regulation includes an action system or behavioural scheme such as using body parts, changing skin colour, heart rate; vocal, and verbal means, play with objects. These are used to change the level of arousal linked to discomfort (Kopp, 1989).

By the 3rd month, the limbs and vision become more mature. Children start to move their hands and arms, and look at them. They try to reach things, and they might experience distress due to lack of control. Before school, primary caregivers play more than one role in children's lives. They feed the children, change their clothes, and keep them calm. With time, the primary care givers move to verbal expression and support (Demos, 1986; Escalona, 1968). After this period, emotion regulation, and cognition are observed more. As the central nervous system becomes more developed (Emde et al., 1976), children begin to use organized behaviour, and the primary caregivers take the role of facilitators. Children use a social smile in face-to-face interactions with their mothers (Brazelton, Koslowski, & Main 1974; Stern

1974). The primary care givers help their children to regulate their arousal. Children learn to discriminate between different states of feelings, and they change their feeling states in order to associate their action with their primary caregivers' actions. By the 5th month, children show more competencies in their communication. They expect a response when they cry. They use different types of cry to indicate that they are hungry, wet, and experiencing pain. They learn to change their negative feelings in their interactions with their mothers or caregivers. This might be the result of development in the children. They are able to discriminate between faces (Nelson, 1987). They are attentive to visual and auditory stimuli (Aslin, Pisoni, & Jusczyk, 1983; Banks & Salapatek, 1983). They develop in temporal sequence and memory (Olson & Sherman, 1983). Children could pick up objects, and examine them. This growth in perceptual coordination is reflected in emotion regulation. The children experience pleasure from playing with toys, and it is reinforced by the primary caregivers. When the children are alone, they try to play with toys. With time they use them to deal with discomfort.

Kopp (1982) reported a rapid growth in motor, social, cognitive, and emotional areas at the end of the first year (Campos et al., 1983; Gesell & Amatruda, 1941; Kopp, 1982; Piaget, 1952, 1954; Sroufe, 1979; Uzgiris, 1967). Emotion regulation can be manifested by different mechanisms. For instance, an infant used emotion regulation as an action mechanism such as moving the head and rubbing the body. An action mechanism is an elemental cognitive, which involves recall of a previous stressful experience in a similar context, and links it with the present experience in order to serve current goals. For instance, children decrease their cries as they hear their primary caregivers' voices rise when they walk towards them. Children learn from social interaction, to control their excitement to a certain extent. The other mechanisms which children use include planned cognitive activity, a higher level of cognition that requires anticipation, evaluation of a solution, and planning a sequential act to change or modify a stressful situation. This starts from the end of year one, and extends to the preschool period. It occurs in the context of moderate stress that enables the child to think. On the other hand, each caregiver has her own way to decide when and how to intervene, and it varies across the stage of

development. Usually, during a distress situation, the intervening time is short, and it delivers a specific message.

Management of distress might lead to withdrawal from social contact or further interaction. Demos (1986) noted that children can benefit from negative emotional experiences. Because distress is unavoidable for humans, a developmental task for children involves learning to modulate, tolerate, and endure experiences of negative effect (Kopp, 1989). Acquisition of new cognitive skills accompanies an increase in children's stock of emotion regulation mechanisms. They communicate with their primary caregivers about more distinct needs. They show discomfort if they do not get what they want. Children explore their body parts. They chew their fingers, and rub their genital organs. When they want to withdraw from an interaction they chew their fingers. Playing with their body parts could bring pleasure to them (Escalona, 1963; Kris, 1958; Provence & Lipton, 1962; Spitz & Wolf, 1949 in Kopp, 1989).

In the months 18-30, children use language, which is a powerful tool to describe their emotions (Bretherton, Fritz, Zahn-Waxier, & Ridgeway, 1986; Dunn, Bretherton, & Munn, 1987 in Kopp, 1989). Later, as toddlers, they show growth in emotion communication parallel to their expansion in language production period (Church, 1966; Gesell & Ilg, 1943; Murphy, 1956 in Kopp, 1989). For instance, children show temper tantrums, and resistance to adults. Such behaviour reaches a maximum at 4 years old (Jones & Burks, 1936; Wenar, 1982), but children show anger and competition more with their peers (Berne, 1930; Dawe, 1934; Goodenough, 1931; Murphy, 1956 in Kopp, 1989). It was observed that fear is common at this age (Jersild, 1943; Jersild & Holmes, 1933). Kopp (1989: 349) said:" *During verbally mediated social interactions children learn causal associations about words, acts, positive and negative emotions, and social sanctions and proscriptions about emotion feelings and expressions".*

Young children use language to express their feelings during social interaction with their peers, especially in pretend play (Dunn et al, 1987). They talk freely about their feelings, and share their experiences with other children. This helps them gain a better understanding of their feelings, and they try to find ways to regulate them without fear of others. Children try to restore confidence, and support for themselves and others about the event that caused fear or arousal to them. Kaler (1987:349)

"speculates that preschool peer contacts may provide a powerful context for emotion regulation, perhaps even greater than situational factors with parents". She indicated that children have their own effective ways of acceptable distress management. Added to that, perception of the stressor varies from one child to another. Children estimate, and consider a situation. Then, they select an appropriate response to the stressor.

Children use emotion regulation to control frustration and excitement experiences (Lazarus & Folkman, 1984). Crying is a coping strategy that reduces the internal feelings that children experience, but it does not regulate their behaviors. Kalpidou et al (2004) indicated that the connection between emotion and behaviour regulation starts at 2 years. Children start to understand and internalize some social rules with an extent of excitement. During 3-5 years, this relationship is well-established (Kopp, 1989, 1992). As children grow older, they need very limited assistance from adults to regulate their emotions and behaviours. They show more submission and comfort while they are working on the task. Older children show a strong association between emotion regulation and obedience during the task. Emotion regulation develops more as the child grows older.

2.6.1.2 Primary caregiver role in emotion regulation

At this sensitive period of children's lives, the caregivers play a crucial role in children's learning. Learning is not limited to literacy and numeracy, but it includes emotion, social, and behaviour regulation (Conner, 2007; Smart, Sanson, Baxter, Edwards, & Hayes, 2008). There are important aspects in primary caregivers that have an effect on the type of the self-regulatory experiences that children receive, and carry with them to school. First is the way the primary caregivers were brought up in their own home context. Second, the values the primary caregivers have in terms of what is appropriate emotion and behaviour. Usually, the values are associated with the culture and beliefs of the people. The primary caregivers become very careful in the home context. They interact with their children, and they are aware that the children are modelling them. The primary caregivers use appropriate words to express their feelings and love to their children (Dunn, Bretherton, & Munn, 1987). They show the children that in their own words and body expression. Even when the

children learn with them literacy and numeracy the primary caregivers show patience and understanding that it is their first experience. The children learn that it is alright to make mistakes. Also they learn how to control their emotions, and to do a little problem solving in a calm atmosphere (Connor, Son, Hindman & Morrison, 2005).

Third, Sroufe (1990, 1995) found that parental accepting of their children and development of secure attachment are important for the children's self-regulation. Sensitivity of the primary caregivers to children's physical and emotional needs, and their presence in stressful situations which children come across, reflects secure attachment. Secure attachment helps to develop flexible self-regulation which has a positive impact on the children's academic and emotional status in the beginning of schooling (Clark & Ladd, 2000; Zeanah, Boris, & Sheeringa, 1997; Carlson, Jacobvitz, & Sroufe, 1995; Egeland, Pianta, & O'Brien, 1993; Jacobvitz & Sroufe, 1987). Development of personality at an early age trains the children to deal with frustration, disappointment, and cope with delay of their needs. They learn to cooperate with others, and engage in give and take relationships. They learn to have fun with others, understand their pleasant responses and handle tensions that may result from interaction with them.

By school entry the children have acquired basic self-regulatory skills to help them to deal with their new teachers and peers. At the same time they stay calm, and respond to the demands of academic tasks (McClelland, Kessenich, & Morrison, 2003; Son & Morrison, 2007, Conner, 2007). Development of children's personality through such experiences is important for their academic attainment and future life.

2.6.1.3 Emotion regulation before school and effect upon school success

There is a relationship between the extent of emotion regulation before school entry and academic success in the school. Kalpidou et al (2004) observed preschool children aged 3-5 years working on a task, material play, look at toys, do nothing, play with toys, until the first toy contact. The study revealed that 5 years old children showed greater emotion regulation than the younger children during a sorting task and looking at the toys. They performed better than younger children on the task. This means that emotion regulation made children comfortable while working on the task, and allowed them to focus on the work.

Duncan, Dowsett, Claessens, Magnuson, Huston, Klebanov, Pagani, Feinstein, Engel, Brooks-Gunn, Sexton, Duckworth, and Apel (2007) carried out 6 longitudinal studies on 5-6 year old children. They investigated the relationships between school readiness, academic level at school entry, attention skills, socio-emotional skills, future reading and maths attainment. They found that attention skills and maths are the powerful predictors for school success. Both skills require attention to allow young children to work on a task for a long period of time.

Liew, McTigue, Barrois, and Hughes (2008) conducted a longitudinal study on 733 American children who were identified as having problems in literacy at the beginning of grade 1. They found a relationship between children's social, emotional, behavioural regulatory skills and future reading. Conner (2007) reported that McClelland et al. (2003) found that emotion and self-regulation are linked to literacy development. They added that parents had an effect on their children's social, emotional and behavioural regulation at home. Bodrova & Leong (2006) and Hamre & Pianta (2005) found that young children's experiences in both preschool and primary class have effects on children's self-regulation skills. They have an influence on the extent of conflict between teachers and children which leads to either success or failure (Conner, 2007).

Researchers (Ladd & Price, 1987; Ladd, 1990; Margetts, 1999; Griebel & Niesel, 1999, 2000; Fabian, 2000) found that a transition from preschool to primary school is stressful to some children, and might have a long lasting effect on them. They indicated that a transition from a familiar informal setting such as a preschool or home to unfamiliar formal setting such as primary school is challenging and creates stress for some children. Children move from a smaller place where they have more freedom, play and are not judged on their academic achievement to a larger place, with new teachers, and children (O'Kane and Hayes, 2006). In the primary school most of the instruction is verbal (Myers, 1997; Rimm-Kaufman, Pianta & Cox, 2000; Margetts, 2002). Children are expected to sit in one place for a long time, and the focus is on their academic achievement. During the transition period, children experience lots of changes in a short period of time (Margetts, 2000). Primary school teachers expect children to fit within the system, and respond to their regulation (Rimm-Kaufman et al, 2000; Pianta & Cox, 2002). Parents also expect their children

to do academically well (Griebel & Niesel, 2001). All these aspects create disturbance in some children, and affect their focus in the school (O'Kane & Hayes, 2006).

Stephen and Cope (2003) investigated 27 children during the transition from preschool to primary school in Scotland. They indicated that children are expected to fit within a class environment. When some children have learning problems, it is assumed that the problems are within children (medical approach). School does not consider the class environment as a possible cause for the children's problems (social approach). This might place these children at risk of rejecting school from their first experience.

Niemi, Poskiparta, Vauras, and Maki (1998) conducted a 4 years longitudinal study on 252 Finnish preschool children. The study began before children entered grade 1. The children were assessed in preschool, grade 1, 2, and 3 in order to locate those at risk. The sample was divided into experimental and control groups. At the beginning of grade 1, the experimental group received training in phonological awareness and self-image for 4 months. Benefits were observed in spelling, decoding, and comprehension. 4 months later, at the beginning of grade 2, 8-10 % had very poor scores in decoding, spelling, and reading comprehension at the end of grade 1. These children had reading problems in grade 1. In preschool, these children had average scores in verbal intelligence, and meta-cognition, and scored above the mean in listening comprehension. At the end of grade 2, all children were asked to write about a picture, 13 % of the sample wrote a few words with no coherence, and they experienced difficulties. Their spelling was below average. However, the preschool records of these children were at an average level. In grade 3, the training continued and the researchers found a group of children who resisted the training. These children had social behaviour problems during grade1 and 2. They explained that the negative results of the children were related to emotional problems since they had entered school. These children entered school with negative perception towards authorities (the teacher), and disliked submission to the rules. These emotional feelings had had an effect on their interaction with the teacher. They were not attentive in the class, and they ended up with learning problems which were not within the interest of the training.

Children's personal characteristics, the style of the relationship they develop with their teachers and other children in the class when they join school have an impact on their adjustment to school (Belsky & MacKinnon, 1994; Ladd & Burgess, 2001). The children who come to school, and learn how to regulate their emotion, and have social skills, form good relationships with peers and teachers; there is a greater chance that they make a smooth adjustment to school, and show progress in their academic work (Buhs & Ladd, 2001; Ladd & Burgess, 2001; Pianta & Steinberg, 1992; Pianta, Steinberg, & Rollins, 1995). Such qualities help in positive adjustment to school. However, there are marked individual differences. Some children could adjust very easily to a school context. Others experience difficulties. It was found that the parent child relationship before transition to school is linked with children's adjustment to school (Barth & Parke, 1993; Clark & Ladd, 2000).

Parents' beliefs, knowledge about the nature of children and appropriate ways of rearing have significant effects on development of social and behavioural skills required in children's interaction in the class. For instance, parents who are child-centred in their beliefs help their children to be independent. They are aware of their children's needs and interests, but parents who are adult centred in their beliefs use more instructions in their interaction with their children. They pay less attention to the children needs and interests (Parke, 2002).

Children of parents who have supportive marital relationships develop social relationship and have rarely display behavioural problems. Fathers in such circumstances are sensitive to their children's needs (Cox, Paley, & Harter, 2001). They play a distinctive role in their children's rearing especially in the relationships outside the family context (NICHD Early Child Care Research Network, 2004).

O'Kane and Hayes (2006) found from their interviews with 249 preschool and 250 primary school teachers in Ireland that fewer than 20% of children experienced difficulties during the transition stage. The teachers in both institutes mentioned that cooperation between preschool and primary school could help children in the transition. Some studies (Entwisle & Alexander, 1999; Margetts, 1999, 2002; Dunlop & Fabian, 2003; Wylie & Thompson, 2003 in O'Kane and Hayes, 2006) noted that if these children are not provided with help to move smoothly to school during the transition, negative experiences during this period might affect their academic career.

In Bahrain, Hadeed and Sylva (1999) conducted a study on 140 children with a mean age of 48.7 months. They explored preschool education in three settings, home, preschool care oriented, and preschool educational oriented. The preschool groups were classified based on management practice (teacher or child centred) and staff attitudes. The last two groups attended preschool for three months when they participated in the research. All the children were assessed before school entry and at the end of grade 1. Stanford-Binet, Form L-M (Terman & Merrill, 1961), Arithmetic and Block Design Subtests from Wechsler Preschool and Primary Scale of Intelligent (1963), The Draw- A-Person (Harris, 1963), The Pictorial Scale of Perceived Competence and Social Acceptance For Young Children (Harter & Pike, 1984) and Preschool Behavior Checklist (MGuire & Richman, 1988) were used to form a profile about each child in cognitive, social and emotional areas. Information about the child's background such as child age, sex, mother's level of education and father's occupation were included.

They found that the children who were enrolled in the preschool performed better than the children who stayed at home in language, memory, vocabulary, counting, and conceptual maturity measurements. The children who attended the educational oriented preschool were the best on all the measures. It included self-esteem, self-confidence, and emotional conduct. They found that the children in the home setting watched T.V two times more than the children in the other settings. Attendance at the centres had a more positive influence on children's counting and verbal mathematical skills than on spatial ability skills in comparison to the children at home. The children in the educational settings had access to more educational sensory materials than the other children. These factors encouraged the children to be active participants in learning, and led to better achievement than the children in home and care settings.

The child age was a strong predictor of high achieving on the measures. Hadeed and Sylva indicated that this finding is consistent with Harter's theory in which it was mentioned that children aged 5-6 become sensitive to their abilities, and they become more concerned about self. In this study, boys performed better than girls on language, perception and counting. They also had more emotional conduct problems

than girls. The study showed no significant relationship between home variables and outcomes measures.

In summary, it is important that young children enter school with sufficient emotion regulation in order to interact in a positive way with some new experiences in the school. A child's personality and his home rearing practice are important elements in transition to school. Children who do not develop social skills, and are over protected by parents might have difficulties in transition to school. At the same time home, preschools, and schools need to cooperate to help the children have a smooth transition to primary school.

2.6.2 Development of scales to assessing children' strategies to cope with stress

Researchers followed different procedures in order to develop some approaches and scales to assess coping in people. Rossman (1992) analyzed children's coping responses and developed categories to refer to cognitive and behavioural coping. Then, items were constructed to fit within each category. Other researchers (Colletta, Hadler, & Gregg, 1981; Hyson, 1983; Wertlieb, Weigel, & Feldstein, 1987; Zeitlin, 1980) constructed their own tools from instruments used in studies of adult's copings. Wills (1985) used existing adult instruments with some modifications to make them appropriate for children (Ayers, Sandier, West & Roosa, 1996). Ayers et al (1996) indicated that each of these approaches has its strengths and limitations. For instance, the first approach provides full information about each category of the construct, but it does not indicate which one is more related to important outcomes. The second approach suggests domains, but it is possible that it does not pay enough attention to some important areas. For instance, Band and Weisz (1988) used categories in the Adult Ways of Coping Scales (Folkman & Lazarus, 1980) and found that 40% of children's coping did not fit within these scales. The third approach could be appropriate for prediction purposes, but it does not provide information about the concept of the construct.

There are at least four frameworks or scales which were developed by researchers and were used to study or assess coping with stress in children. At least two of them were used with adults and two were modified from adult's scales to suit children in terms of age and gender. These are the following:

2.6.2.1 The transactional model

The transactional model of stress for Lazarus & Folkman (1984) is widely used in adults' and children's research on coping. The model deals with stress during a person's interaction with a situation. It focuses on short term stressors. It introduces a "cognitive appraisal model" which is a process a person goes through to evaluate a stressful situation. He finds out if the stress is related to him or not. If it has an effect on him, he moves to what is called "primary appraisal" in which he does a more detailed evaluation of the situation. He thinks about the physical or emotional harm that he might get from the stressor. This includes his values, goals and self-esteem. He does further evaluation on the benefits, harm for himself or beloved people. This evaluation is subjective. A situation might be stressful for one person, but it is not so for another person (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986). Then, he moves to a more specific level which is called "secondary appraisal". At this stage he evaluates his resources, and what he can do to solve the problem, prevent harm or to gain benefit. After that, the person appraises the available options. For instance, he might think to change the situation, avoid an impulsive response, accept the situation or seek more information. In summary, the primary and secondary appraisal appraises the whole situation in terms of harm and benefits, and what can be done.

According to Lazard and his colleagues (1984) coping has two functions. The first function is to regulate a person's internal emotion which is caused by an external situation, and this is called emotion focused coping (e.g. ventilation of emotion, distraction, and avoidance). It is used if a person thinks the stressor cannot be altered. The other function is to modify the situation in the person's external context. It is not necessary to remove the stressor (Field & Prinz, 1997). It is called problem focused coping. Lazarus and Folkman (1984) mentioned seeking information as a possible solution in problem solving strategies (Lazarus, 1980). It is still an effort and judgmental. Folkman & Lazarus, (1980) found over 98% support for the presence of the two functions or strategies in their studies of men and women. In another study (Folkman & Lazarus, 1985) of college students, they found 96% of them reported using these two strategies in stressful situations.

The immediate outcome depends on a person's judgment. A person might look at it in terms of his goals, expectation and the demand. Sometimes the stressor is not removed, but the person is pleased with the outcome which is the situation management. In another occasion, the situation is resolved, but the person is not satisfied with the outcomes. It is possible it ends up with more conflicts. Children use these strategies to control frustration and excitement experiences (Lazarus & Folkman, 1984).

2.6.2.2 Other frameworks for assessing coping in children

The following are other approaches used to assess coping in children:

1. Moos and his colleagues (Billings & Moos, 1981; Ebata & Moos, 1991) paid more attention to the individual's coping efforts. They used active (approach) and passive (avoidance) coping. In active or approach coping a person tries to understand the situation, and he places cognitive or behavioural efforts to deal with the conflict or situation. For instance, he seeks information. In passive or avoidance coping, a person makes similar efforts, but in the opposite direction to avoid thinking about the stressful situation. Ebata & Moos observed that adolescents who used active coping display higher wellbeing than others who use passive copings.
2. Miller (1987) suggested an approach similar to the one developed by Moos and his colleagues. The emphasis is on the way a person deals with his reaction to stress by regulation information relevant to threat. He developed two broad approaches which can be used in emotion regulation. The first approach is blunting. Blunting is composed of strategies which can be used to avoid threat through distraction or viewing information about threat in a more positive manner. Blunting includes reappraisal, cognitive and behavioural distraction. Monitoring involves strategies to focus on the threat or to seek information about the threat (Hoffiner, 1993).
3. Sandler, Tein, and West (1994) suggested a model which they developed in 1993. It is a four factor model of dispositional and situational coping which includes the following dimensions:

- Active strategies, the aim of the child is to either change the situation or develop positive attitudes towards it.
- Distraction strategies: the aim of the child is to drift his thinking or involvement in the situation by doing or thinking about another thing.
- Avoidance strategies: the aim of the child is to deal with his internal emotions. It includes behavioural and cognitive avoidance or distractions.
- Support seeking strategies: They include both problem focused and emotion-focused support (Sandler, et al, 1994; Ayers et al, 1996; Smith et al, 2006).

Ayers et al (1996) think that this model is appropriate for the age and gender of children. It includes wide ranges of copings (11 categories). It can be used in different situations and over time (Ayers, et al,. 1996; Smith, Eisenberg, Spirad, Chassin, Morris, kupfer, Liew, Cumberland, Valiete & Kwok, 2006).

An important concept for individual's coping is coping efficacy which is concerned with the belief in the child that he could deal with the demand of situation or emotional arousal with success. Sandler, (2000) proposed that if a child's effort in coping with the situation was successful, his efficacy level will increase, and it will also increase the possibility of using the same strategy in the future; whereas if his effort was associated with negative consequence, his efficacy level will be lower. He might feel helpless (Smith, et al., 2006).

2.6.3 Children and stress

The style of coping people use to deal with a stressful situation could make the effect of the stressor easy or worse on their functioning. People are different in the degree they react to either approach (monitor) or avoid the information their brains receive about the stressor (Miller & Green, 1985, Peterson & Toler, 1986). A selection of a certain coping strategy depends on the situation whether it can be controlled or not (Band & Weisz, 1988; Folkman, 1984; Miller & Green, 1985). In the first situation which can be dealt with such as receiving poor grades, children used approach (monitoring) strategies. They may try to solve the situation by working harder (Lazarus & Folkman, 1984). In the second situation, children may try to manage it by reducing their emotion arousal. It was found that the most used coping strategies in such situations are avoidance strategies particularly cognitive distraction (Brown,

O'Keefe, Sanders, & Baker, 1986). Adults are able to ease painful situations (McCaul & Malott, 1984) whereas children use gratification (Mischel, 1974).

An effective way to deal with an unpleasant stressor or situation is to drift attention to an opposing thought or activity. This action is difficult for children under 7 as it is difficult for them to ignore unrelated stimulus in order to make an appropriate judgment (Odom & Corbin, 1973; Pryor, Rholes, Ruble, & Kriss, 1984 in Altshular & Ruble, 1989). Research (Brown, Bransford, Ferrara, & Campione, 1983) has found that younger children lack awareness of their mental state and they have difficulties in changing it.

Carroll & Steward (1984) and Harris & Olthof (1982) indicated that young children have limited awareness of their own thoughts and coping strategies which require problem solving compared with older children. It is possible that they could make a change which originates from a particular situation, but seldom from internal thinking (Altshular & Ruble (1989). They could deal with controlled stressor or stimuli by using situation or problem based approaches (Band & Weisz, 1988). They might use such strategies with success in situations where distraction is more appropriate. Research also revealed that younger children find it hard to used distraction strategies or others which require manipulation of mental state (Band & Weisz, 1988; Harris, Olthof, & Terwogt, 1981; McCoy & Masters, 1985; Reissland, 1983). For instance, Yates, Yates and Beasley (1987) asked children to mention some strategies to cope with uncontrolled context which included a positive incident (waiting for a cake). It was found that older children suggested more cognitive distraction strategies than younger children. Young children provided motor or behavioural strategies which involved distraction such as looking at the ceiling. It is possible that they could comprehend the reason for using distraction in order to change emotion when it involves only concrete or behavioural style or positive consequence. Miller and Green (1985) found that children in very painful situations which were uncontrolled preferred to use avoidance strategies which were very effective. He indicated these strategies prevent stressful information from reaching their brains. However, in controllable situations, they used strategies which involved a proportionate decrease of stress but did not shut out external unpleasant information. Donaldson and Waterman (1986) indicated that younger children find it

difficult to keep in mind two incompatible emotional responses at the same time. It might be confusing to spend effort to avoid a situation and monitor it too. Children find it easier in this situation to use avoidance strategies only. Research (Jay, Elliott, Katz, & Siegal, 1987; Nocella & Kaplan, 1982; Siegel & Peterson, 1980; Visintainer & Wolfer, 1975) found that 5 years old children can be trained with adult assistance to use effective avoidance strategies such as guided imagery or counting when they come across medical stressors, but they might not use them with other painful situations or independently.

It can be concluded that there are two types of coping strategies. One type is positive coping strategy which can be created by an individual himself or trained to use it. For instance, watching a funny program while waiting for a dentist helps children to avoid thinking about fear and to overcome anxiety or emotion arousal. It helps them to be less scared. The other type of coping strategies is negative coping strategies. They do not provide a solution for the problem, but they are positive from the view of the children. They help them to deal with the anxiety or the stress. One example of this type is a child crying in the classroom during first days of school enrolment which is a negative coping strategy, as it does not solve a problem. Children have to stay at school. They will not be taken home. However, children find it useful because they can deal with their anxiety and fear of separation and of not going back to their homes. Another example is nail biting which children use when they become angry. They use this strategy to deal with their anxiety.

2.6.3.1 Children's coping in medical and social context

Band & Weisz (1988) Interviewed 73 children from grade 1 to grade 7. The age range was 6 to 12 years. The child was asked to describe in detail what happened, his feelings, and what he did or thought about in order to deal with the situations. The first situation involved separation from a friend. The second was about a mother, father or teacher being angry at a child. The third was about one child who said bad things to him. The fourth was about receiving unexpected low score in an exam. The fifth was about having an injection in the hospital. The sixth was about an accident in which the child was physically hurt. They found that the children could recall some stressful incidents in their lives, and they could say how they felt, and evaluate what

they did. In over 96% of the responses children noted that they spent effort to change the situation, and not only to control it. It was observed that children reported using more primary coping (problem focused coping) on the first four incidents which were either social or about receiving a bad score. Children described them as controllable. In the other two situations which were not regular situations and uncontrollable, children used more secondary coping (emotion focused coping) which they preferred to deal with internal emotions. They found that younger children employed problem focused strategies more than emotion-focused strategies. For instance, the children used direct problem solving, problem focused support, and defending themselves. They found that with increased age, this type of strategy decreased, and emotion focused coping increased. They indicated that older children were flexible in their selection of the strategy based on the context. Some children used positive self-talk and cognitive avoidance. It was concluded that the type of strategy used by children depends on the situation and cognitive development.

Altshular & Ruble (1989) conducted a study to investigate developmental change in children's knowledge of coping strategies. The sample consisted of 72 children from three age groups 5-6, 7-8 and 10-11 years. Children were interviewed while waiting to see their doctor for a routine check-up. Four stories were presented to the children. The first two stories involved uncontrolled stressors which were accompanied with positive consequences. The first one was about a girl who was eager to get a jar of candy, but she was asked to keep quiet for an hour. The second story was about a boy who was exited about his birthday, but he was asked to keep quiet in the school. The other two stories involved negative stressors. The first story was about a boy waiting for the dentist, and the other about a girl waiting for the doctor to receive an injection. Pictures were used with the stories. IQ tests were used in order to compare children on chronological and mental age. Individual interviews were conducted for 30-45 minutes in two days. A break was provided between the types of stories. After telling the story children were asked two questions to describe the child's feeling. The first one was open ended ("what do you think this boy or girl is feeling now" (p.1340). In the other question, children were asked to select one of three emotions ("which of these three best describes the way she or he might be feeling?" p.1340). In the positive story the choices were scared, tired or excited; whereas in the

negative story the choices were scared, tired or happy. For the purpose of investigating a developmental difference in their abilities to propose some strategies useful for fearful and frustrated situations, the same stores were repeated. This time the examiner described the child in the story as either scared or excited. Children were asked to suggest what the child could do about his or her feeling or thinking. They categorized the strategies into the following:

1. Approach: It involves problem focused coping (cooperate or change the situation), seeking information, and focus on positive aspects
2. Emotion manipulation: It includes relaxation, thinking about a reward, cry, pray, and express feeling to another person
3. Avoidance: It includes both partial avoidance and complete avoidance. The former involves behavioural distraction such as have fun, play, and watch T.V or cognitive distraction such as thinking about another thing or fantasy. The latter includes escape such as leaving the place and sleeping or denial such as not to think about it or imagine it does not exist.

Altshuler & Ruble found that all children suggested avoidance strategies in order to deal with their emotional distress more than trying to change the situation (emotional focused more than problem focused coping). Most of the children across the age groups suggested behavioural distraction strategies in both positive and negative situations. However, fewer younger children suggested cognitive distraction strategies (especially in the injection story) compared with older children. This means that children as they grow older mentally manage their emotion in uncontrolled situations. It also indicates that older children are more flexible in coping with stress. They also found that escape (complete avoidance) decreased with age. However, no difference was found between groups in denial (partial avoidance) which involved a high level of cognitive thinking than the complete avoidance which is concrete and direct. Altshular & Ruble explained that it is possible that younger children could not comprehend the stressful situation accurately and in turn their suggestion was not appropriate. Younger children could not select scared as an appropriate word to describe negative emotion. A second point is that these children might not know that thought can be changed. They added that young children's knowledge of distraction is based on their experiences rather than a concept, and this explains why younger

children used more behavioural than cognitive distraction strategies. A third point is that younger children when they imagine a stressful situation tend to either react with higher emotional arousal or their thoughts are blocked by emotional arousal. In both cases it prevents them from problem solving. In this study no significant relationship was found between I Q and use of any strategy.

Altshular & Ruble concluded that avoidance strategies could be the most effective strategies for young children or even adults when they come across very difficult situation, and they want to control it, but it is not always effective to manage a person's emotional arousal. It could have a negative effect in certain situations with some individuals such as escape when about to receive an injection. They indicated that short and long-term effects must be looked at when using avoidance strategies. Altshular & Ruble suggested presenting an audio or visual program to young children waiting in the hospital in order to maintain their attention (behavioural distraction).

Hoffner (1993) carried out a study on American children aged 6 to 12 from grade one to six. The aim was to investigate their suggestions for coping in uncontrolled situation. She used Miller's framework for coping (1987). These were blunting which involves avoidance (which includes reappraisal, cognitive distraction, and behavioural distraction) and monitoring or seeking support (which involves thinking about threat cues and asking some questions about the danger). She presented children with four stories which involved fear in uncontrolled situations. The first story was about a dentist drilling in a child's tooth in order to fill it. The second was about a doctor stitching a cut on a child's arm. The third was about a child on a plane which may crash. The fourth was about a child waiting for his test results and afraid that he may have failed. Children were asked to imagine themselves in such situations and evaluated their feelings of fear on a 5 points scale (from not at all to worried or scared. Then, they were asked to say what they might do or think about in these situations in order to feel less scared or worried. It was found that more than two-thirds of the total responses were suggestions to use blunting strategies to cope with the uncontrolled situation which means that children preferred to use blunting. Reappraisal was the most suggested strategy followed by cognitive distraction and behavioral distraction. It was found that there was a developmental pattern in using

blunting strategies. Children in higher grades (fifth and sixth) used more of these strategies than children in lower grades (first and second). They found this pattern in all situations except the plane situation where the most used strategy was behavioural distraction. Focusing on threat aspect was used more than seeking information.

It might show that children have effective ways to deal with their emotions when they come with extremely uncontrolled situations.

Altshular & Ruble's (1989) and Hoffner's (1993) work showed that children vary in their proposed use of coping strategies. This variation was due to the type of procedure used in each study. In the first study the children were waiting in the hospital; whereas is in the second they were asked to imagine themselves within the situation. The place where the children were waiting contained distractions such as drawings on the wall. The only exception in the second study was the situation in the plane which involved waiting, and children used behavioural distraction more than other strategies.

Sandler et al (1993) studied social coping with anxiety and depression in children aged 7 to 13 years old. They explored the relationship between coping and psychological adjustment and used the four-dimensional model. They did not find a positive relationship between avoidance coping and children's feeling of anxiety and depression.

However, it should be noted that self-reporting provides information about children's knowledge in reaction to internal the processes which are involved in coping, but it does not provide a broad picture of the childrens' understanding of such mechanism. What children say does not necessary show what they feel or what they can do. They do not always have enough verbal language to express themselves, and sometimes they say what adults like to hear.

Bernzweig, Eisenberg, & Fabes (1993) and Eisenberg et al. (1993) indicated that parents reported that their children used seek support strategies; whereas the children themselves mentioned that they used more avoidance strategies. Four other studies were conducted with older children age range 7- 12 years old (Band & Weisz, 1988; Compas, Malcarne, & Fondacaro, 1988; Gamble, 1994; Jenkins, Smith & Graham, 1989). They found that the children employed direct problem solving, problem focused aggression, intervention in parental quarrels, independent attempts to solve

the problem, and offering comfort to parents. Few children used emotion-focused strategies such as seeking support.

Bagdi and Pfister (2006) investigated children's and their parents' perception of the children stressors, and the coping strategies which the children use to deal with the stressors. The sample was 34 children from the United States. The children's age was in the range 5.1 to 9.3 years old. They were enrolled in kindergarten to grade 3. They presented a list of events to both groups, and asked them to evaluate them. They found that the children reported higher level of stress than the parents. The children used cognitive, social, and emotion coping strategies. An example of the first one was a child tells a story about a loved person who has passed away while doing her homework. Examples of social strategies were distraction and taking initiative. In distraction, the child might ask her sister to do the work with her to get away from a fight with her mother. In taking initiative, the child goes to his mother, gives her a kiss, and says everything is going to be alright. In emotional coping strategies, the child used crying, fear, anger, and comfort seeking from adults, and aggression. These coping strategies made the children feel better at that time, and reduced the stress, but most of them were non productive .They did not help them to resolve the source of the problem, the stressor.

2.6.3.2 Assessment coping strategies in classroom context

There are terms which were used to refer to behaviour in the classroom. These are task-focused behaviour, off-task classroom behaviour, disruptive behaviour, problem behaviour, and task avoidance. Task-focused behaviour refers to the skill children were trained to use to solve academic tasks. It can be categorized as a positive coping strategy because it helps children to deal with the demand or challenge of the academic task, and at the same time they solve the task successfully. The other four behaviours are negative coping strategies because they do not help children to solve the academic task.

2.6.3.2.1 Assessing negative coping strategies during academic tasks (Task focused strategy versus avoidance or off task strategy)

School psychologists added sophisticated procedures to functional behavioural analysis in the area of academic skills (Roberts, Marshall, Nelson & Albers, 2001). First, they developed a simple conceptual framework to investigate the assumed role of academic difficulties in the existing of the behaviour and proposed intervention plan (Daly, Witt, Martens & Dool, 1997 in Roberts, et al, 2001). Second, they observed a relationship between the difficulty level of academic tasks and off-task classroom behaviour (Center, et al., 1982; Depaepe, Shores & Jack, 1996; Meyer, 1999 in Roberts, et al, 2001). Nelson, Roberts, & Smith (1998) for example reported that many educators believe that FBA provides a focus on academic and social behaviour in the classroom. They added that difficult academic tasks could increase the frequency of escape or avoidance behaviour (Roberts, et al., 2001).

Yon Lee, Sugai and Horner (1999) used FBA to explore the possible relationship between academic achievement, off-task behaviour (which in this study refers to non academic work to escape from the difficult task which means that it is an avoidance coping strategy) and disruptive behaviour (negative coping strategies) displayed by pupils who experience severe academic difficulties and behavioural problems. FBA can be defined as some methods used to gather information about antecedents, behaviour, and consequences. Such information helps to find out the function or reason of the behaviour. The collected information will be used to plan an intervention program to eliminate the problematic behaviour and also to facilitate positive behavior (Witt, Daly, & Noël, 2000 in Gresham et al, 2001; Ervin et al, 2001). FBA does not depend on one strategy, but it involves a collective of strategies such as observations, interviews, and review of records about the pupil's behaviour, its antecedents, and its consequences. FBA main focus is on identifying environmental conditions linked with occurrence and non-occurrence of unwanted behaviour. In this approach the function of the behaviour is corresponded to a change in the environmental conditions and the effect is corresponded to a change in the

behaviour. The function of the behaviour refers to the purpose that the behaviour provides to a person.

The study was conducted on two 9 years boys from grade three. The first pupil was diagnosed as having difficulties in maths, and displayed problem behaviour (negative coping) associated with his academic difficulties. He was assessed in maths and could do addition and subtraction problems without renaming very well, but he experienced difficulties in completing such tasks with renaming. The other boy was diagnosed as having EBD (emotional behavioural difficulties, another name for negative coping strategies) and attention-deficit/hyperactivity disorder (ADHD). Assessment showed that he had severe difficulties in doing subtraction with renaming and multiplication.

Math Skills Assessment (MSA) was used to assess the pupils' skills in maths. A task was considered easy if the pupils scored above 90%. A task is considered difficult is they scored below 33%. Two sets of difficult tasks were selected. Each set of these tasks was used as an instructional objective during the instructional phase. During the study the observers determined the following:

1. Percentage of intervals with problem
2. Percentage of intervals with off-task behaviour
3. Percentage of correct math problems.

All data were collected when the pupils were engaged in 10 minutes of independent work 3 times per week. The observers monitored problem behaviours (negative coping strategies) for 10 seconds, and recorded it for 5 seconds. Problem behaviours were defined as "aggression (e.g., kicking a desk, tearing paper, throwing objects) and disruptive behaviours (another term for negative coping strategies, e.g., talking out, being out of chair, making noise, playing with objects and making faces). Off-task behaviours were defined as pausing, looking around, and engaging in irrelevant activities (e.g., drawing pictures) for longer than 2 consecutive seconds (Yon Lee, et al, 1999: 197)". Descriptive functional assessments were carried out using interviews with teachers, reviewing school records, written math skills assessments, and direct observation of behaviour (antecedent behaviour consequence assessment). Yon Lee et al found that both pupils used problem or off-task behaviour in order to escape from the difficult tasks. Both of these behaviours are negative coping strategies in

this academic context because they drift children's attention away from academic tasks and lead to low academic attainment.

Roberts, et al (2001) conducted two phases study on three pupils. They used both FBA procedures and curriculum based assessment (CBA). One of them was from grade 1 and the other two from grade 4. These children were selected by their teachers as having learning difficulties in maths, and they used off-task behaviour (task avoidance strategies). The purpose of the study was to explore the use of curriculum-based assessment (CBA) in (FBA) in order to locate antecedent events that cause off-task behaviour in mainstream classrooms. They used CBA to find the antecedent events that cause off-task behaviour in the classroom. In particular, they wanted to make changes in the CBA to find if off-task behaviour is a way to escape from an academic activity which is difficult in relation to the pupil performance level. Second, they wanted to investigate possible use of FBA in the classroom setting. Third, they wanted to investigate the use of this procedure with ordinary pupils instead of the pupils with special needs. In the beginning, the researchers asked the teachers to complete Teacher's Report Form (Achenbach, 1991 in Roberts, et al, 2001) in order to get details about the level of the problem. All the three pupils scored above 65 out of 100. The dependent variable was the frequency of the off-task behaviour. It includes the following:

1. Inappropriate movements such as out of seat, running around, and fidgeting in seat
2. Inappropriate vocalizations such as calling out, off-task classroom noises and arguing
3. Physical aggression such as hitting, kicking and pushing.

Off-task classroom behaviour was measured every 15 second interval during 15 minutes for both descriptive and experimental conditions. The length of independent "seatwork" time in the classroom was in the range 10-17 minutes.

There were three conditions used in the functional assessment. The aim of the first two conditions was to investigate if the off-task behaviour was escape-motivated. The first condition was related to instructional tasks. The instructional performance level of the pupil in maths was defined as 10-19 digits correct with 3 to 7 errors (Deno & Mirkin, 1977 in Roberts, et al, 2001). Each pupil was expected to complete

10 CBA maths probes in 15 minutes per session. The second condition related to frustrational tasks. Frustrational level performance of the pupil in maths was defined as completing 0-9 digits correct with 8 or more errors (Deno & Mirkin, 1977 in Roberts, et al, 2001). Tasks similar to instructional tasks were administered.

The third condition was designed to observe the off-task behaviour during non-academic tasks. This condition was used as a control to make sure that the off-task behaviour was not attention motivated. During this time the pupil was observed during non-academic tasks such as art projects, computer time and games. The task lasted for 15 minutes.

In phase 1, one to one interviews were carried out to collect the following information:

1. The maths curricular materials used in the classroom
2. The pupil's current level of performance.
3. A description of the pupil's off-task classroom behaviour during instruction
4. Antecedents and consequences of off-task behaviour (A-B-C analysis)

The interview was structured using the Functional Analysis Interview form (O'Neill, Horner, Albin, Storey & Sprague, 1990) and other questions were added to find the exact curriculum variable needed to use CBA or could influence the pupil behaviour. The classroom maths curriculum was used to develop CBA probes which were used to determine instructional and frustrational level tasks for each pupil. After that, each maths probe was administered for 2 minutes. The description of the off-task classroom behaviour and A-B-C analysis was used to identify the time of the day or the academic tasks linked with high frequency of off-task classroom. The collected information was used to decide the most appropriate time for observation during the FBA. After the interview, the pupil academic skill level was assessed using CBA probes, and the required materials were prepared for both instructional and frustrational level academic tasks. The selected academic tasks and the materials for the first condition were not too easy or too difficult in relation to the pupil skills. However, for the second condition the activities and material were too difficult for the pupil. For this purpose, 3 CBA probes were used to determine the fluency and error rates which were used to measure the pupil skill performance in maths. Based on this level of performance other, extra probes either easier or more difficult than

the previous ones were administered until the instructional and frustrational levels were determined. Then, descriptive analysis for FBA was carried out for each pupil for both academic and non-academic activities in association with high rates of off-task classroom behaviours to make sure that the function of the behaviour was escape motivated (Roberts, et al. 2001). The direct observation was used to utilize hypotheses about the role of off-task classroom behaviour, and its functional relationship with instructional and frustrational level academic activities. For A-B-C descriptive analysis, 27 observations were carried out during seatwork time to identify the antecedents, and consequences linked with each occurrence, and the frequency of off-task classroom behaviours. The antecedents were academic and non-academic activities. The consequences were escape, teacher attention, or peer attention. Each time the pupil worked on a task, the observer recorded the type of the antecedent and consequence involved.

During phase 2, the focus was to validate the hypotheses constructed during descriptive analysis FBA; the difficulties of the academic tasks were frequently changed during the functional assessment. This was done by changing the academic variables which was observed to be associated with the existence of the off-task classroom behaviour. At the same time, other environmental conditions and variables were kept as constant as possible (Mace, Lalli & Pinter-Lalli, 1991 in Roberts, et al. 2001). In this phase, modified CBA tasks were used with the pupil during seatwork time. 22 observational sessions were conducted. Each was 15-20 minutes in length. The difficulty of academic activities was changed by administrating instructional and frustrational academic activities, in conjunction with monitoring the changes in both off-task classroom behaviour and academic performance. The mean for inter-observer agreement for off-task classroom behaviour was 93% for ball sessions and inter-rater agreement for mean was 92%. The mean inter-rater reliability for the function of off-task during A-B-C analysis was 95%.

Roberts et al (2001) found that the three children used more off-task classroom behaviours during academic tasks (mean of academic task versus non-academic task for first pupil 67% versus 19%, the second pupil 76% versus 15%, the third pupil 69% versus 12 %). The results indicate that the pupils used the off-task behaviours to escape from the academic activities. In the three cases the off-task classroom

behaviours continued because of escape from frustrational level academic activities. Two important conclusions derived from this study. First, CBA procedures provide a method to determine the events associated with off-task behaviours in the classroom setting. They provide a way to determine instructional and frustration levels within the curriculum for each pupil; also, they suggest a way to change curriculum materials during FBA. In addition, CBA procedures supply a way to determine its effect on the pupil behaviour. Second, a functional relationship between instructional and frustrational level academic activities and off-task classroom behaviours in the classroom setting was found for each pupil. It was confirmed that the difficulty of the curriculum is related to off-task classroom behaviours. The percentage of the off-task behaviours (task-avoidance strategies) increased when too difficult curricular tasks were administered. The study suggested that academic difficulty could be an important factor need to be considered when planning intervention for off-task classroom behaviours.

Onatsu-Arvilommi and Nurmi (2000) explored the relationship between the coping strategies (achievement strategies), reading and mathematical achievement at the beginning of grade 1. The sample size was 105 Finnish grade 1 children. The age of the children was between 6-7 years. The children were assessed 3 times during the year. Before school entry, the children were assessed on cognitive abilities. The researchers used reading, maths, a cognitive test, and teacher reports. They used Draw a Man Test (Goodenough, 1926) which required the child to draw a figure of a person and they used the Visuo-Motor Copying Test which required the child to copy geometric shapes and abstract figures. In reading, the Reading Skills Test (Onatsu and Nurmi, 1995c) which involved the syllable recognition task and reading comprehension task was used. In math, three tasks were used. A child was asked to complete six number rows (e.g., 0, 3, 6,.....18), do simple addition (e.g., 2+6=..., 7+9=..) and subtraction (e.g., 7-3=..., 17-5=...). Task-avoidant strategies were measured by three indices: helplessness, task-irrelevant behaviours, and lack of persistence. They found that low reading and mathematical skills at the beginning of grade 1 was associated with an increase in task-avoidance strategies. Task avoidance strategies were associated with low self-esteem and hopelessness. They added that repeated failure leads to adapting avoidance strategies. They found that the transition

period is critical for the development of coping strategies. They revealed that the children who used task avoidance strategies showed less improvement in reading and maths than the children who used task-focused behaviour (positive coping). They added that the avoidance strategies might have a long-term negative impact on the children's academic achievement and their behaviors. This study indicated that grade one children in the mainstream used coping strategies when they came across difficult tasks, but it did not provide detail about the coping strategies.

Damico, Nelson, Damico, Abendroth and Scott (2008) conducted a qualitative study on a 9 years old American boy who was diagnosed with reading difficulties. The child was asked to take turns in reading with a competent adult reader. The study involved interactional analysis of the child's social behaviour during three reading sessions over a two weeks period. Each session lasted for 30 minutes. The focus was on the verbal and non-verbal behaviours of the child. It was observed that the child had 143 turns to read. When he was asked to read or when he expected to be asked, he did not read, but he used 105 avoidance strategies during the three sessions. This number of avoidance indicates that the child was aware of what he was doing and he planned to avoid reading when he anticipated his turn. He used six types of avoidance strategies. These are:

1. "Interjection of off- topic comments": the child gives some comment or does something irrelevant to the reading topic when he was asked to read or he anticipated that he was going to be asked to read.
2. He provided a description from the picture or said some words to extend the last part of the story which was just read by the adult.
3. He repeated what the adult just finished reading instead of reading new text.
4. He began to read by asking about a topic related to what was just read or about a certain word in the text.
5. "Interjection of on-topic comments": he made some comment on the story instead of reading it.
6. He refused to read using verbal or nonverbal behaviour.

The first two strategies were the most frequently used and his preference. The "Interjection of off- topic comments" avoidance strategy was used 35% of the time when the child was asked to read. Actually, the child was waiting for his turn to read

although he was poor in reading. He used this strategy because it was not appropriate socially to give direct refusal when requested to read. The second most frequent strategy was the second one. The child tried to comply, but he constructed his own text from the picture instead of reading the actual text. It was mentioned that the child was described in one of the school reports as distractive and inattentive in reading because he was using the first avoidance strategy. Damico et al explained that the child was in conflict in this situation, as he could not read. He used "compensatory adaptation" which were the avoidance coping strategies in order to avoid reading, and at the same time to have appropriate social interaction. They added that these avoidance strategies were beneficial from the point of view of the child because they prevented him from reading and the adult started to read again. They indicated that the adult provided the child with a good model of reading and the child released his tension. They noted that it is important to identify the function of this behaviour in order to plan effective intervention.

It can be concluded that using both direct observations of children's behaviours in the class with teacher's report might be more effective in assessing children's coping than using either self-reporting or the adult's report only. Children with learning problems use more negative coping strategies to deal with the demands of the academic task.

2.6.3.2.2 Educational environment

Georgiou, Manolitsis Nurmi, and Parrila (2010) reported five important aspects for academic success. These aspects are achievement strategies (Aunola, Nurmi, Niemi, Lerkkanen, & Rasku-Puttonen, 2002; Cantor, 1990), achievement beliefs (Aunola et al., 2003) and behaviour, motivation (Pintrich, Roeser, & De Groot, 1994), and goal orientation (Nicholls, Cheung, Lauer, & Patashnick, 1989).

2.6.3.2.3 Successful experience and task focused behavior (effective coping)

Children who had previous successful learning experience on a particular task which resulted in high self-concept, effort beliefs and orientation used such positive thinking and behaviours to develop high expectations towards success in new tasks in the future (Georgiou et al, 2010). They also used more task-focused behaviours.

However, unpleasant previous experience involved low self-concept and beliefs in effort and less attention could develop a negative perception for future success. It leads to paying less effort and engagement in more task avoidance in similar situations. Eventually, it raises the possibility of failure in new challenging tasks. Two explanations were presented to explain the link between negative expectation and low effort and task avoidance. The first explanation is that task avoidance gives children what is called "attribute excuse" for their failure in the future. It means that children use the task avoidance such as playing with others as a reason for their low achievement on the task. The second explanation behaviour reduces the stress (Miller, 1987) created by the task which is beyond their personal resources, and it increases their risk of failure. It also decreases their motivations, interests (Eccles, et al., 1993), and perceptions toward the value of the task (Schiefele, 1991).

The frequency of using either task-focused behaviour or task avoidance behaviour depends on the level of challenge or difficulty of the task. If the task creates high frustration or challenge, it increases failure expectation and leads to task avoidance. As a result, it increases the possibility of experiencing more difficulties with the task and low attainment. Seymour, Aro, & Erskine, (2003) indicated that the extent of challenge in learning literacy varies across different orthographies. For instance, it is less challenging to read in a transparent orthographic language than an oblique one. The oblique orthography needs more work and excessive task focused behaviour is important for learning.

Also, the level of challenge of literacy learning varies within a language. For instance, Greek is very regular in reading, but it is not the case in spelling. A phoneme could have 3 to 5 ways in writing. The same is applied to reading fluency and comprehension.

Georgiou et al (2010) carried out a longitudinal study to investigate the impact of using task-focused behaviour on decoding, reading fluency, spelling and reading comprehension. They wanted to find out if using task-focused behaviour at kinder garden level, grade 1 and 2 predicts literacy attainment in grade 2 and 3. The sample size was 95 Greek children. They used teacher observations to report task focused behaviour which was used in previous studies (Aunola et al., 2002; Fyrstén, Nurmi, & Lyytinen, 2006; Onatsu-Arvilommi & Nurmi, 2000; Stephenson et al., 2008), and

was found more reliable for this age group than self-reported procedure (Butkowski & Willows, 1980; Cain & Dweck, 1995). The following measures were used:

1. Vocabulary and nonverbal cognitive ability for general cognitive ability.
2. Elision and blending tasks phonological awareness.
3. Colour and object naming for rapid naming.
4. Digit span and non-word repetition tasks for phonological memory (kindergarten only).
5. Non-word decoding
6. Word reading speed for reading fluency
7. Dictated words for spelling
8. Reading passage for comprehension
9. Behavioral Strategy Rating Scale-II (BSR-II; Aunola, Nurmi, Parrila, & Onatsu-Arvilommi, 2000), Examples of the questions are "Does the student have a tendency to find something else to do instead of focusing on the task at hand? Does the student actively attempt to solve even difficult situations and tasks? Does the student give up easily? Does the student demonstrate initiative and persistence in his/her activities and tasks? If the activity is not going well, does the student lose his/her focus?"(p.4). a scale of five points was used (very much /easily to not at all).

Georgiou et al (2010) found that task focused behaviour which was measured one year earlier was a predictor for both spelling and reading comprehension in Greek. However, this was not the case with non-word decoding. The researcher added that motivation and the way it is used in the classroom had an important role in literacy development in children especially if the tasks are increasing in difficulty. They revealed that teacher judgment of children's behaviour is a reliable procedure to predict future attainment in reading and spelling.

2.6.3.2.3.1 Motivation and achievement goals

This part discusses two important relationships. The first one is between motivation and either task focused behaviour or task avoidance behaviour. The second relationship is between student's class achievements goal and these behaviours

2.6.3.2.3.1.1 Motivation and children behaviour in the classroom

Short and Ryan (1984) conducted a study with 42 good and poor readers from fourth grade. They provided the readers with instruction on story grammar. They focused on the use of five "wh" questions, the story grammar component. The aim was to increase comprehension-monitoring skills. The readers were also provided with attribute instruction. They were asked to say before they began reading: "Praise yourself for a job well done". The readers were divided into four groups. One group received training only. The second group learnt the attribute instruction only. The third group received both training and attribute instruction. The fourth was the control who received neither training nor attribute instruction. They found that the readers who had training, and both training and attribute instruction showed better attainments than others. It means styles of learning and positive attribute or effective coping strategies together are important in learning (Paris & Oka, 1989).

Researchers (Butkowsky & Willows, 1980; Johnston & Winograd, 1985) found that poor readers or students with learning problems (Paris & Oka, 1989) attributed their failure to their low ability and their negative thought towards success. They also attributed their success to both internal and external causes (Jacobsen, Lowery, & DuCette, 1986; Licht, Kistner, Ozkaragoz, Shapiro, & Clausen, 1985).

Cullen (1985) studied how 8 years old children cope with failure. He observed four types of coping types:

1. Strategy-oriented children used suitable strategies to monitor and correct failure.
2. Action-oriented children asked for help or continued working on the task.
3. Anxiety-oriented children showed signs of guilt, embarrassment, and negative effect.
4. Anger-oriented children used aggression, frustration, or withdrawal to deal with failure.

Cullen found the first two groups coped very well with failure. The other two groups felt helpless, tried to defend themselves, and were confused. As a result they could not cope with the failure (Paris & Oka, 1989). Borkowski (1987) found similar results. He indicated that to encourage children to learn to use effective strategies in

learning diverts their attention away from negative attribute. It also helps them to maintain and generalize effective reading strategies (Paris & Oka, 1989).

Borkowski, Weyhing, and Carr (1988) carried out an intervention program with 75 children and adolescents with reading difficulties. The aim was to increase motivation in participants. The experimental group received instruction on summarization strategies, and attribute statements such as "I need to try and use the strategy"; and "I tried hard, used the strategy, and did well"(p. 36). Part of the control group received training on summarization strategies only. The rest used attribute statements only. Significant results were found in the group who had both training in summarization strategies and attribute. Ryan (1984) and Reid and Kistner, Osborne, and LeVerrier (1988) conducted a study with 48 disabled children from grade 3 to 8. The purpose of the study was to examine the relationship between the attribute and achievement acquired in reading, maths, and spelling. They found that the learners who made improvement were those who thought that effort was the cause of their failure; whereas the learners who showed least improvement were those who thought that their failure was due to their low ability. This negative thinking had an impact on the learners' cognitive thinking. They became less motivated and engaged in the reading task than others (Paris & Oka, 1989).

Children who have learning difficulties such as dyslexia have low motivation because they experience frustration in learning literacy (Alexander-Passe, 2006; Polychroni, Koukoura, & Anagnostou, 2006; Snowling, 2000). Andreassen, Knivsberg, and Niemi (2006) found that frequent individual counselling had a positive impact on reading progress in dyslexic children. This improvement was related to positive motivation.

The above studies show that motivation is important and task focused behaviour is a positive coping behaviour with the demand of the task.

Wigfield, Eccles & Rodriguez (1998) found a relationship between high motivation, achievement beliefs and behaviours (Bois & Cooper, 2004) and high academic achievement. Examples of positive achievement beliefs and behaviours are mastery beliefs, task-focused behaviours, and coping efforts. On the other hand, an association was found between low motivation, feeling helpless, use of task-avoidant behaviour, and fear of failure, and low academic attainment (Aunola, Nurmi,

Lerkkanen, & Rasku- Puttonen, 2003; Greene, Miller, Crowson, Duke, & Akey, 2004; Lepola, Salonen, & Vauras, 2000; Mantzicopoulos, 1990).

Quirk (2008) found that both motivation and orientation on the task were important for reading fluency, and they increased the children's engagement in the task. Reading comprehension involves a series of skills such as recognition, learning vocabulary, and integration of information in paragraph, and across paragraphs which require continuous attention, and motivation from children (VanderVeen et al., 2007).

Georgiou et al (2010) in their study found that motivation and self-belief (Valentine et al, 2004; Georgiou, et al. 2010) were important when high challenging tasks were presented to children. It was found that teachers who focused on providing pupils with emotional support, and provided instruction in individual or small groups and used child-centred learning, the pupils in their classes evaluated their own abilities high, developed high success expectation and increased preference for more challenging tasks, and they experienced less anxiety (Stipek, Feiler, Daniels,& Milburn, 1995). On the other hand, teachers who did not pay enough attention to emotional support, taught in large groups, focused on skill acquisition, their pupils evaluated their own abilities as low, and experienced frustration and anxiety when they were exposed to challenging tasks.

In summary the level of motivation and attribution are important for learners in order to cope with the difficult academic tasks, and enhance on task-focused behaviour instead of negative coping strategies such as task-avoidance.

2.6.3.2.3.1.2 Meaning of learning and type of goals

Achievement goal theory of motivation in education (Ames, 1992a; Anderman & Maehr, 1994; Nicholls, 1989) paid attention to the meaning children form about school and learning. It explains the meaning in the context of goals which the learning environment determines and children comprehend when they participate in academic tasks (Ames, 1992a; Anderman &Maehr, 1994; Kaplan &Maehr, 1997; Maehr & Midgley, 1991). The theory identified two forms of goals. The first type is mastery goals which emphasise learning, improving and mastery of skill, and the second type is performance goals which pay more attention to social comparison and

competency demonstration (Kaplan, et al., 2002). An example of a personal mastery goal is: "I like math work that I'll learn from even if I make a lot of mistakes". (Kaplan, et al., 2002: 210), and an example of personal performance approach is: "I would feel really good if I were the only one who could answer the teacher's questions in math class" (Kaplan, et al., 2002: 210).

Research identified two forms of performance goals (Elliot & Harackiewicz, 1996; Middleton & Midgley, 1997; Skaalvik, 1997). One is the performance approach, in which learner is fully attentive to demonstrate high ability, and the other is performance avoidance goals in which the learner is less attentive to the task, and avoids demonstrating low ability (Kaplan, et al., 2002). An example of personal performance avoidance goal is: "An important reason I do my maths work is so that I won't embarrass myself" (Kaplan, et al., 2002, P.210).

It was found that children who used mastery goals developed deep cognitive strategies (full attention). They could control their learning. They acquired positive coping strategies with difficult tasks or failure. They also developed positive emotional perceptions toward learning tasks and school. However, children who were involved in academic tasks in order to demonstrate their abilities had shallow cognitive strategies. They exhibited negative emotions toward the tasks, and displayed inappropriate behaviours such as postponing the task.

In some studies this negative relationship was found frequently in performance avoidance goals. In other studies it was linked with anxiety and non-achievement (Elliot & Harackiewicz, 1996; Elliot & Church, 1997; Elliot, McGregor, & Gable, 1999; Middleton & Midgley, 1997; Skaalvik, 1997; Kaplan, & Middleton, 2001).

Kaplan and Maehr (1999) carried out a study with grade 6 American students. They found a connection between students' personal types of goals and their disruptive behaviours (negative coping strategies) in the classroom. Examples of such behaviours were disrespect to other, leaving one's seat, teasing, and talking out of turn. They found a negative relationship between personal mastery goals and disruptive behaviour reported by students. Personal performance goal was positively related to disruptive behavior in African American students only. The students with performance avoidance goals were not included in this study (Kaplan, Gheen, & Midgley, 2002).

Kaplan, et al., (2002) reported that Kaplan and Maehr (1999) found a relationship between the students' perceptions of the school goals structure, and their reports of disruptive behaviours (30% of the variance). Similar to personal mastery goals, African American students' perceptions of the school mastery goal were found to have a negative relationship with the students' reports of disruptive behaviours, and the European American students' perception of performance approach goal structure of school was found to have a positive relationship with such reported behaviours. Mastery goals helped students to pay more attention to learning, and be involved in the academic task. As a result they developed more task-focused behaviour, and were less engaged in disruptive behaviour (Cusick, Martin, & Palonsky, 1976; Doyle & Carter, 1984) However, performance avoidance goal was found to be related to anxiety which may prompt disruptive behaviours or "handicapping strategies" which were used to protect self-worth such as postponing study to the last minute (Middleton & Midgley, 1997; Skaalvik, 1997; Midgley & Urdan, 2001). These students used disruptive behaviours to justify their failure in the class instead of their low ability (Baumeister, 1997; Covington, 1992). Mastery goals were found to have a negative relationship with these "handicapping strategies" and performance approach goals were not related to these behaviours. The latter was found to be associated with orientation on the task, and low beliefs which means high ability. It is possible that performance approach goals might not have a strong connection with disruptive behaviour. Kaplan et al (2002: 193) concluded that: "students' personal achievement goals partially mediated the relationship between perceptions of the school's goal structure and disruptive behavior".

Disruptive behaviour (negative coping strategy) was perceived as something within the student, and a result of lack of class management from the teacher side or both are involved. Most of the intervention programs which were constructed to deal with the disruptive behaviour were based on behavioural modification. The emphas was to increase the desired behaviour through praising and use of tokens, ignoring, and time out (Canter & Canter, 1992; Martens & Meller, 1990; Ringer, Doerr, Hollenshead, & Wills, 1993; Bear, 1998; Cameron, 1998). Other programs encouraged self-management training (Anderson & Prawat, 1983; Hoff & DuPaul, 1998).

Recent research drew attention to preventive approaches (Bear, 1998; Butchart & McEwan, 1998; Brophy, 1996; Freiberg, 1999) which place emphasis on the school policy and teaching styles. Kaplan, et al., (2002) think that achievement goal theory which focuses on the relationship between the quality of the class environment and student behaviour could provide a preventive approach for such behaviours.

Class goal structure is involved in all aspects of life or learning which take place in the classroom. It has an effect on each student regardless of the type of his goal and on his disruptive behaviour. The following are examples of class goal structure reported by students (Kaplan, et al., 2002: 211):

1. Mastery classroom goal structure: "My math teacher thinks mistakes are okay as long as we are learning".
2. Performance approach classroom goal structure: "My math teacher says let us know which students get the highest scores on the test".
3. Performance avoidance classroom goal structure: "My math teacher tells us that it is important that we do not look stupid in math".

The following are examples of teacher goal related approach (Kaplan, et al., 2002):

1. Mastery focused approach to instruction: "I make a special effort to recognize students' individual progress even if they are below grade level".
2. Performance focused approach to instruction: "I display the work of the highest achieving student as an example".

The meaning of involvement in the academic tasks in order to pursue learning, or ability demonstration can be discussed between teacher and students. This meaning is reflected in the message the teacher conveys. Research has found a relationship between the learning environment's goal structure, and student personal goal on the academic tasks; a similar relationship was also found between student cognitive and emotional thinking. These relationships were similar to the ones which are involved in personal achievement goals previously mentioned.

Kaplan et al (2002) conducted a study to examine if there is a relationship between classroom goals structure and occurrence of disruptive behaviours (negative coping strategies) in the classroom. The participants were 338 American students from grade 9. It included different ethnic groups from 60 classes. Surveys were used to ask students about their own personal achievement goals, class goal structure and

whether they were involved in disruptive behaviours during maths class. Other surveys were carried out with maths teachers. They were asked about their instructional goals. Kaplan, et al., (2002) found variation among classes in disruptive behaviours. They indicated that classroom goal structure was a significant predictor of this difference. They revealed that in the classrooms where an average student's perception valued demonstration of ability and achievement better than others, the proportion of disruptive behaviours was higher than that in the classroom where the values were focused on learning, understanding and improvement, the proportionate of such behaviours was low.

Kaplan, et al., (2002) observed some differences between classrooms which focus on mastery goals and performance goals. In the mastery goal classroom the focus is on the purpose of attending school which is to learn, improve and master skills. On the other hand, in the other classroom the emphasis is on displaying high ability and making sure that teacher goals are reached. The first class offers variety of tasks, students are active, and the role of the teacher is to facilitate learning, and the student is recognized as an individual and evaluated in relation to his previous performance. In contrast, in the second classroom, one task may be presented, the student has a passive role, the teacher has a major role, and the student is compared with others. However, one important distinction is in what is considered as an acceptable behaviour or disruptive behaviour in the classroom. Kaplan et al (2002 indicated that the idea of whether a behaviour is disruptive or not is settled and agreed upon through a discussion between teacher and students, and should not to be decided by objective criteria. For instance, the teacher whose focus is on mastery goals becomes more flexible with behaviours such as talking out of turn or leaving ones' own seat. She introduces some teaching strategies which allow students to be active participants, and have more freedom to talk and move around. However, the teacher whose focus is on standard and performance beliefs uses instructional strategies which allow full control on the classroom and tolerance is very limited.

Kaplan et al (2002) found a relationship between teachers' reports of goal-oriented approach in instruction and the student's total perception of classroom goal instruction which means the role of the teacher is very important in the classroom

goal. Classroom of mastery goals had lower disruptive behaviours than the other two forms. This finding was independent of student characteristics.

Kaplan et al (2002) indicated that it is important to consider a wider view which focuses on the relationship between the meaning of learning and success and the level of disruptive behaviour instead of using very strict rules to establish full control of students in order to minimize disruptive behaviour. They emphasized that disruptive behaviour was of teacher concern in performance-oriented classrooms. They added if mastery goals are considered as an alternative, such disruptive behaviours will be reduced. In this case, there will be no need for behavioural modification which also follows very strict rules, and the consequent might not for long time.

2.6.3.2.3.2 Effective instruction

Some researchers have found curriculum related variables such as task requirements (Cooper, Peck, Wacker & Millard, 1993; Winterling, Dunlap & O'Neill, 1987 in Roberts, et al, 2001), the type of instructions provided (Singer, Singer & Horner, 1987), pupil preference (Cooper et al., 1992; Dyer Dunlap & Winterling, 1990 in Roberts, et al, 2001), choice making (Dunlap et al., 1994), preference assessment(Newton, Ard, & Horner, 1993), task difficulties (Weeks & Gaylord-Ross,1981; Center, Deitz & Kaufman, 1982 in Roberts, et al, 2001), and length of the task or activity (Dunlap et al, 1991) could affect the occurrence or non occurrence of problematic behaviour.

Yon Lee et al (1999) reported (Bloom, 1976; Carnine, 1980; Carroll, 1963; Englemann & Carnine, 1982; Gagne, 1962, 1985) that it is important that pupils acquire all component skills needed to learn a task. This knowledge makes larger tasks easier to be learnt, and it increases access to positive reinforcement; whereas deficiency in one or more of these components will result in difficulties in learning more complex skills and access to positive reinforcement is decreased also.

Yon Lee et al (1999) reported that the magnitude of reinforcement depends on the rate of reinforcement, quality of reinforcement, delay of reinforcement delivery, and response efforts (Horner & Day, 1991; Mace, Neef, Shade, & Mauro, 1994; Neef, Shade, & Miller, 1994). They added that the probability that a pupil engages in task-

focused behaviour which has positively reinforced consequences is higher than that of less positive reinforced consequences. Similarly, if the use of good instruction is connected with more correct responses, the chance that the rate of positive reinforcement the pupil receives is increased. The increase in the rate of the positive reinforcement that the pupil receives from engaging in task-focused behaviour encourages the pupil to engage in more task-focused behaviour. Accordingly, the rate of his engagement in off-task behaviour is reduced; whereas in other instructional circumstances where a pupil experiences failure, the chances of receiving a positive reinforcement for correct answers are fewer. As a result, the rate of engagement in task-focused behaviour is reduced and the pupil turns to use escape. Escape leads to more reduction in task-focused behaviour, and it prompts engagement in more off-task behaviour. They concluded that if academic success acts as a reinforcer for more engagement in task-focused behaviour, good teaching could be an effective intervention for some social behaviour.

Yon Lee et al, (1999) in their previous study had a broad objective which was to explore the effect of instruction in reducing the occurrence of disruptive behaviour, and off-task behaviour displayed by pupils who were experiencing severe academic difficulties and behavioural problems. They also investigated the functional relationships between the presentation of easy versus difficult tasks and the occurrence of problem and off-task behaviours among these pupils. They use the following four phases:

a. Teaching first set of the difficult tasks
b. Performing the tasks
c. Teaching second set of difficult tasks
d. Performing difficult tasks

The pupil was asked to solve the problems in 10 minutes. After that, he was asked to check his answers and put "+" for correct responses and "0" for incorrect ones. No attention was given to problem or off task behaviour except in harmful situations. When the pupil said he could not do it he was asked to do his best. During the session, no reinforcement of any type was provided (e.g., Teacher praise, token reinforces, reprimands, and social behavior corrections).

During functional analysis, the first set of difficult tasks was presented in phase A and easy tasks were provided in phase B. Then, the difficult tasks were analyzed in order to spot which component skills of the difficult tasks were not acquired. Then, he was instructed on the difficult components until he reached accuracy of 85%. During this time the pupil received a positive reinforcement for a correct answer or an appropriate behaviour. The same thing was done with the second set of the difficult tasks.

Yon Lee et al found a functional relationship between the introduction of difficult tasks and problem or off-task behaviour. In difficult tasks, the mean for off-task behaviour for the first pupil was 43.4%, and for the second pupil was 29.9%. In the easy tasks, the mean for the off-task behaviour was 5.5% for the first pupil, and 12.5% for the second pupil. An increase in the pupil's performance was observed after each time he received instruction on component skills of difficult tasks; reduction in escape motivation and off-task behaviour was also found (first pupil accuracy M= 95% and off-task M=8.7%t; second pupil's accuracy M= 94% and off-task M= 7.5). It was concluded that effective teaching and curriculum are important for academic success and reduction of off-task or problematic behaviour.

Roberts, et al, (2001) believe that CBA provides a practical treatment to direct and determine antecedent events that are involved with the presence of off-task classroom behaviour in the classroom context. They indicated that CBA is beneficial in the use of FBA in the classroom setting, and contains a reliable and valid procedure. The administration time is short, and is sensitive to show growth in pupil responses in short periods, and uses the same academic materials that might cause problems or off-task behaviour in the classroom, and can be applied to determine the performance level of a pupil within the curriculum. After setting up the performance level of the pupil, materials can be developed, and used with the pupil to do a functional assessment during usual classroom activities. The procedures offer a systematic way to manipulate the difficulty of the curriculum for the pupil in the classroom and monitor the problem or off-task behaviour concurrently.

One important implication of Georgiou et al (2010) previous study was to avoid presentation of a very negative or frustrating task which increases levels of anxiety in children. This leads to failure expectation, and low self-concept, and use of task

avoidance. In contrast, task-focused behaviour provides children with positive feedback for learning, and promotes success expectation. Therefore, it is important to provide children with an appropriate learning environment to enhance task-focused behaviour.

Georgiou et al (2010) suggested using "adaptive teaching" Corno, 1995, 2008; Corno & Snow, 1986). This model suggests that teachers adapt their teaching to each child's skills, capacity and needs. They could organize individual or small group instruction. This model provides a similar vision to the "Instructional Delivery Model" of Gickling (1977) which aims to provide children with instruction appropriate to their skills and needs.

Previous studies focused on "task avoidance" behaviour (same as off-task classroom behaviour) and did not mention the "on task" coping strategies which some children use when they experiences anxiety while working on academic tasks.

Rimm-Kaufman, La Paro, Downer, and Pianta (2005) carried out a comparison study between children who had instruction in large classroom settings and those who had instruction in small group settings. They found that a smaller setting stimulates more positive task-focused behaviour than a whole classroom instruction.

2.6.3.2.3.3 Learning styles

Keefe (1979:17) defined learning style as a set of "cognitive, emotional, characteristic and psychological parameters that serve as relatively stable indicators of how a learner perceives, interacts with and responds to the learning environment" (Doyle & Rutherford, 1984). This section contains three parts. The first part describes some models of learning styles. The second part notes findings from some studies on matching instruction with learning styles of learners. The third part explains the relationship between learner learning styles and culture. The fourth part is on learning styles in Bahraini context.

2.6.3.2.3.3.1 Models of learning styles

The following are some of the models which describe people's various learning styles.

Keefe (1979) distinguished four learning styles with important implications for the progress of learning.

1. Perceptual modality preferences which refers to forms of senses that learners use in order to interact with their environments and gather information. These are kinesthetic, visual, and auditory forms. Kinesthetic learning involves direct contact with objects. Visual learning involves observation of objects and reading knowledge. Auditory learning involves listening to lectures or conversations. Although people have preference sense in their seeking of knowledge, they could use various senses depending on the learning situation.
2. Field independence versus field dependence. Witkin and his colleagues (1962, 1977) in their theory placed more focus on the surroundings of learners. They indicated that a learner is considered field dependent if he is social and friendly with people, and could not perceive himself or other things as separate from his context such as a wholistic thinker. He starts with a broader picture and extracts meaning which is associated with the whole. He finds it difficult to extract a figure from a wholistic picture. In general, the field dependent learner is global. He depends on his right brain more than the left. He is very visual and spatial. He uses intuition in his work, and has non linear thinking. He considers other views in his decision making. He refers to authority for a guide. Field dependent is believed to be located in societies which focus on group and family. An example of such a learner is the Native American in the United States (Pewewardy, 1995; Swanson, 1995).

   On the other hand, the field independent learner is more analytical, logical and sequential. He prefers to work alone. He could recognize that a whole task could be divided into smaller parts which could be added together to form the whole task. An Example of this type of learning is in western society. In the school, the focus is on analysis, sequencing and abstraction.

3. Conceptual tempo. Kagan (1966) has referred to accuracy and speed in response. If children are asked to identify a figure hidden in a picture, one child might respond and provide the wrong answer; whereas another child might take a longer time in order to respond. The second child investigates various options and validates them. Then, he selects the most appropriate answer. He is careful in this work. Usually, he provides a correct answer. Kagan (1966) described the first child as an mpulsive learner and the second as a reflective learner. The main variation between the two is the time they spend in thinking about the problem. Kagan (1966) also introduced two categories "analytic" and "thematic" learners. The former learner is interested to find fine details and form a pattern in his learning. The latter learner is concerned with a general view of the task (Doyle & Rutherford, 1984; Swanson, 1995). He does not dig deep. Pewewardy (2002) indicated that an example of a reflective learner the is Native Americans student. He indicated that the student takes his time to watch, and listen before he talks. When he talks he makes it short. He added that American teachers might interpret this behaviour as lack of interest or motivation.
4. Leveling versus sharpening. Gardner (1959) indicated that the "level" learner tends to remember the situation as a whole, but does not remember its components. On the other hand, the "sharpen" learner pays more attention to the details of the situation rather than the whole situation.

Kolb (1976, 1984) explained in his theory of experiential learning that a learner makes progress through a learning cycle. During this time, he comes across experiences. He observes and reflects on his learning in order to conceptualize knowledge. He mentioned that the cycle is composed of the following four steps or modes:

1. Concrete experience: learning is influenced by a person feeling and response to his experiences.
2. Reflective observation: learning takes place through observation and listening. The learner then internalizes the experience. Learning takes place through investigating assumptions (deduction) and finding possible relationships.

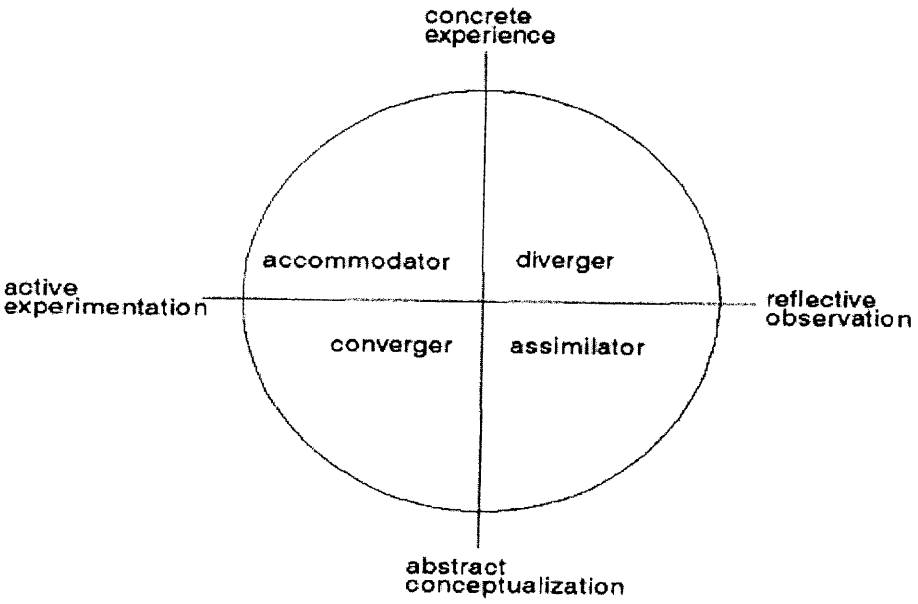
3. Active conceptualization: learning leads to the formation of theory and concept which is a product of internal thinking and analysis.
4. Active experimentation: learning takes place through doing things. It is the opposite of active conceptualization. A learner investigates theories and concept in the real world. He puts it into practice (Kolb, 1985 in Severiens & Tendam, 1994; Swanson, 1995; Reynold, 1997).

Kolb (1984) used the above procedure to develop the four learning styles in his Learning Style Inventory: These are:

1. Converger learner: a person who focuses on a specific problem and depends entirely on deduction reasoning to solve it
2. Diverger learner: a person who uses a wholistic approach. He uses his imagination. He looks at a problem from different angles and depends entirely on production of ideas.
3. Assimilator learner: a person who uses inductive reasoning in solving a problem in order to reach theoretical conclusions. He uses observation and reflection in order to form concepts.
4. Accommodator learner: a person who creates plans and conducts experiments and adapts that to a certain context (Kolb, 1984 in Swanson, 1995 & Mangina, & Mowlds, 2007).

Figure (2-2) shows that a converger learner uses active experimentation and abstract conceptualization in his learning, but he might use other forms of learning in some tasks.

Figure 2-2 Kolbs' model of experiential learning (Severiens & Tendam, 1994:495)



A more recent instrument to assess learning styles is The Gregorc Style Delineator (Gregorc, 1982a). Gregorc described four styles of learning. These are:

1. Concrete sequential: A person learns through step by step procedure and using his senses.
2. Abstract sequential: A person uses symbols in their learning. He learns through reading and listening.
3. Concrete random. A person learns through trial and error. He uses his intuitions and prefers to work independently.
4. Abstract Random: A person learns through evaluation of information. He likes unstructured learning and experimenting (Claxton & Murrell, 1987; Gregoric, 1982a; Greggs, 1991 in Swanson, 1995).

The Grasha Reichmann Student Learning Style Scale (Grashna, 1972 in Swanson, 1995) measures students' ways of interaction in the classroom. Grashna identified six learning styles. These are:

1. Dependent students: They depend completely on the teacher in their learning.
2. Independent students: They like to work alone.

3. Competitive: They are motivated to learn in order to be better achievers than others.
4. Collaborate students: They like to work with their peers.
5. Avoidant students: They are passive and not interested in the subject.
6. Participant students: They interact with others while they are learning in the classroom.

Curry's onion model (1983) composed of three layers based. He place the model or the theory on a layer based on the extent it focuses on the relationship between external educational factors and learning style. The inner layer which is the core of the onion contains basic personality traits. Claxton and Murrell (1987) and Griggs (1991) noted that the traits in the inner layers are more stable, and they might not respond to instructions. Witkin's instrument was placed in this layer. The instrument measures the impact of either field dependent or field independent personality on the preferred style of learning.

In the second layer, Curry placed the theories which deal with information processing. Kolb learning Style Inventory was placed in this area. This layer contains learning styles that are expected to be more stable that the ones on the outer layer. However, it is possible for it be modified based on the context. The outer layer contains theories that assume that educational external factors have an impact on the learning styles (Severiens & Tendam, 1994; Swanson, 1995). It deals with differences among learners in the classroom. The Grasha Reichmann Student Learning Style Scale was placed in this layer.

2.6.3.2.3.3.2 Instruction and learners learning styles

Research (Griggs & Dunn, 1984; Charkins, OToole & Wetzel, 1985; Schmeck, 1988; Kampwirth & Bates, 1980) found that identifying learners' style of learning, and matching it with instruction leads to a better learning. On the other hand, research has found that direct, active instruction is useful in teaching basic skills to children in primary school (Good, 1982; Rosenshine, 1979). Some studies have also found reliability and validity problems in the studies of learning styles. There is also little empirical evidence regarding the effectiveness of matching learning styles of the learner with instruction (Cronbach & Snow, 1977; Peterson, 1979). Massa and Mayer

(2006:333-334) indicated: that their study provides no support for "the idea that different instructional methods should be used for visualizes and verbalizes" (Pashler, McDaniel, Rohrer, & Bjork, 2009). Cook, Thompson, Thomas, and Thomas (2009) also used Kolb's model (1985) with 123 medical students, and found no support for the idea that using instruction appropriate to the learner's style improves learning. These studies applied strong methodological designs (Pashler et al, 2009). Mahlios (1981) indicated that learning styles had an influence on the interaction between learner and teachers, but not on learners' achievements. It is possible that there is a need to do more research with children in order to provide more evidence on the positive effect of matching instruction with children's learning styles.

2.6.3.2.3.3.3 Culture and style of learning

Phillips (1990) compared learning between Australian students and Asian students. He found that Asian students used rote learning, worked very hard in order to learn, and liked to seek knowledge. However, they relied on rote learning, lacked creative thinking and initiation. On the other hand, teachers were highly dependent on the book in their teaching, and focused on rote memorization. Students were more dependent on the teacher in their learning. They obeyed rules, and stuck to deadlines (Mangina, & Mowlds, 2007).

Greggs and Dunn (1989) studied the styles of learning of children from different ethnic groups in the United States. They found that Greek Americans in their sample had a highly auditory preference than African Americans; whereas the latter had higher kinesthetic preference than the former. The Mexican Americans were found to have higher tactual preference than Greek Americans. Ramirez and Castaneda (1974) conducted a study on similar groups using the field independent and dependent theory. They found that African Americans were dependent, and liked to model adult figures. They were less interested in small detailed, and not familiar with trial and error tasks (Swanson, 1995).

Scarpaci and Fradd (1985) carried out a similar study on Anglo American and Latin American students from university. They found that the former group was field independent; whereas the latter was field dependent (Swanson, 1995).

2.6.3.2.3.3.4 Bahrain context

There are no published studies on the learning styles of Bahraini children or adults. However, Bahraini society is similar to Asian societies. It is a family oriented society. The culture which is derived from Islamic teachings focuses on the group's work in various aspects of life. The culture encourages memorization of Quran after comprehension of meaning, but the teaching practice in the classroom just focuses on rote learning which pays less attention to understanding of what is being taught. It is also teacher centered learning. Learners depend entirely on teachers from primary level until the university level. Teachers need to identify their students' learning styles, and provide them with tasks which appropriate to their styles of learning at least in the difficult tasks. They also could construct tasks with different level of difficulties. However, based on the above description I expect that a large proportion of Bahraini learners may be field dependent, and they are possibly concrete sequential. They have appropriate memorization skills. The school context also encourages learners to compete with each other. Accordingly, I think teachers need to provide learners with more cooperative learning in small groups. The cooperative learning will help them to understand the concepts and draw conclusions. At the same time, the information will stay in their minds for a longer period of time. The teachers could organize some small tasks of the learners' choice which allow the learners to work alone and be creative. Independent learning is also important. It allows the teachers to let the learners control their learning, and move into deep thinking about the fine details of the learning situation.

In summary educational environment in the classroom it is important to establish task-focused behaviour and prevent children from using negative coping strategies.

2.7 Previous research

This part consists of two subparts. The first is on the gap in the previous research. The second subpart is on the development of the research questions for the present research.

2.7.1 Gaps in the previous research

On an international level, the review shows many of studies of children with problems in reading, writing and numeracy. In Bahrain, there is a deficiency in the research in these areas. There are two main reasons. First there is no funding for research. Second, the number of the researchers in these two areas is countable. I tried to look for research in assessing young children's learning problems and coping strategies. I started with the two main universities in Bahrain. Unfortunately, I did not find either hard or electronic Arabic periodicals. The libraries have electronic access for research databases in English only.

In the Middle East, each university keeps its own research and publications in its own library. This makes it difficult to trace research in any field. The Arabic studies which I mentioned in this review were published in the U.K except the research of Al Omran and Alzera. It was published in an Egyptian Arabic journal. I got it through my personal contact with Al Omran. In terms of coping strategies, the same is applied with Arabic publications. On an international level, I found very limited research on children's use of coping strategies during academic tasks. The main study which I located was for Onatsu-Arvilommi and Nurmi (2000), with Finnish young children aged 6-7 years old. In this study, the researchers did not mentioned details about the reading and mathematical tasks; also they did not list the types of coping strategies. Such details help class teachers to identify coping strategies and children's academic difficulties.

Based on this information, there is a need for two things. On a national level, there is a need to develop a screening test to identify Bahraini young children's problems in reading, writing and numeracy before they join school. On both national and international levels, there is a need to explore if children aged 5-7 years use coping strategies while they are working on academic tasks.

2.7.2 Research objectives

In this research, I have two main objectives. The first objective is to develop a screening test to identify young children with learning problems in reading, writing and numeracy aged 5-6, before school entry. The second objective is to observe and

identify if some children with learning problems use coping strategies while working on academics tasks. For the purpose of this research, I developed the following research questions:

1. Is it possible to develop a reliable and valid screening test to identify reading, writing and numeracy problems in Bahraini children aged 5-7?
2. Did the children who have problems use "coping strategies" to deal with their problems? If the answer is yes, what were these coping strategies? Did these children use the same strategies in reading, writing, and numeracy tasks?
3. Were there aspects other than the academic tasks which affected the children's performances in the school?
4. Did the children who have problems in reading tasks also have problems in writing or in both writing and numeracy?
5. How did the children perform in reading, writing and maths competencies in school at the end of the year, May 2007? Did the children still have problems as found before? Who has problems?
6. Did other children, who did not have problems at the end of the year, use coping strategies?
7. Did the subtests predict how children achieved in the school?
8. Is there an association between the level of attainment in reading, writing, and numeracy and children's age?
9. When is the most appropriate timing for assessing children with learning problems?

2.8 Summary

In this chapter, I discussed some previous research on reading, writing, numeracy and coping in young children. Children learn reading, writing and numeracy during social interaction and problem solving. Phonological awareness, concepts of print and writing children's own names are important for both reading and writing. Phonological awareness is important for reading the shallow Arabic script. Drawing of a human figure and copying shapes share some aspects with text writing. There is a need for an internal model of objects or symbols, plan of action, understanding part to whole relationship and fine motor skills.

Young children learn counting from observing adults. They start with rote memory of the number words and using words such as one more, less. Some children begin counting from one. Then they use counting on strategies or more advanced strategies.

Young children learn emotion regulation in their home context. When they come across stressful situations in a medical or social context, they use coping strategies. Some children use coping strategies when they receive bad scoring. They use two coping strategies, these are problem focused and emotion focused coping.

There are two gaps in the literature. The first gap is on national basis, there is a need for a screening test to identify young Bahraini children learning problems in reading, writing and numeracy before they enter school. The second gap is both on a national and international basis. There is a need to investigate if children aged 5-7 years old with learning problems in reading, writing, and numeracy use coping strategies to deal with the demands of academic tasks.

3 Research methods

3.1 Introduction

This chapter of the research contains a description of the procedure which I followed in order to develop the screening test, and answer the research questions. In the first section, I determine the plan and the time scale for the research. In the second section I describe the research method that I used in this project, and in the third section, I provide detailed information on sample selection. The fourth section is a discussion on the test development; whereas in the fifth section I explain the method of test application. In the sixth section, I determine the procedure which I used in the test application; however, the ethical issues in the research are described in the sixth section. Later, I illustrate the coding, and scoring of the items in the test. Finally, I discuss the interviews which I performed with adult participants in schools and primary education in the Ministry of Education.

3.2 Time schedule for data gathering

The time schedule for data gathering in the study was as follows:

Table 3.1 Time schedule for data gathering

Time	Task
October 2005 ↓ November 2005	1. In pilot study one, I interviewed 20 preschool children in Bahrain to develop and trial the test items. This was conducted after receiving written approval from the preschool principal and informed consent from children's parents.
December 2005 ↓ February 2006	1. In pilot study two, I interviewed two Saudi children in Glasgow at home to further develop and trial the test items. I received informed consent. 2. I completed ethics form application at the University of Strathclyde
(T1) May 2006 ↓ October 2006	Data collection for main study **(phase one):** 1. I completed ethical regulations in Bahrain (Ministry of Education and children) 2. Interviews with group 1(Children with learning problems n= 100) 3. Interviews with adults on use of coping strategies
(T2) May 2007 ↓ June 2007	**Phase two** I received the teachers' evaluations of the children's main competencies in grade 1 and 2 (school outcomes) from schools

(T^3)December 2007 ↓ October 2008	**Phase 3** 1. Interviews with group 2 (Typically developed children n=50) 2. Interviews with adults on their views on assessment policy and some terms used I used in the assessment (e.g., sound of a letter, front and back of a book)

3.3 Correlation and item analysis

The main purpose of this research was to develop a screening test to identify reading, writing, and numeracy problems in young children aged 5-7 in the Kingdom of Bahrain. I used correlation analysis to investigate the degree of relationship between two variables or more.

Correlation analysis considers questions such as:

1. Is there a relationship between the two sets of data? If the answer is no, there is no need to move to the next question. However, if the answer is yes, it means that there is a chance of consistent variation in the two sets of data. The next question is:
2. What is the direction of this relationship? There are two forms of variation. In one form both sets of data change in the same direction. If one set of data increases, the other set of data increases too. And if one set of data decreases, the other set of data also decreases. This is called a positive relationship. In the other form the two sets of data change in different ways. If one set of data increases, the other set of data decreases. This is called a negative relationship. The plus or minus sign is used to show only the direction of the relationship. The third question is:
3. What is the size of the correlation? If the size is zero (two digits .00), the correlation can be interpreted as a score of participant on one variable is not related to his score on the other variable. For instance, he might score high on one variable and low on the other. In the case of a perfect relationship the magnitude is +1. If the relationship is negative, the magnitude is -1. Usually the correlation value is more than .00 and less than +1 (Berman, Cunningham, & Harkulich, 1974; Berman, 1976; Charles, 1995).

The correlation is more appropriate than factor analysis because I have a small sample size.

In this research I used item analysis (Varma, 2006) to explore the relationship between the following independent and dependent variables:

The independent variables are:

1. Reading
    a. Phonological awareness
    b. Concepts of print
2. Writing
    a. Drawing of human figure
    b. Writing own name
    c. Writing a letter to a favourite person
    d. Copying shapes
3. Numeracy
    a. Stages of Early Arithmetical Learning

The dependent variables are:

Teacher's ratings of the children's levels at the end of the year (2006-2007) in:

- Competencies of reading
- Competencies of writing
- Competencies of maths

I used the term "school outcome" to refer to it in this research.

3.4 Sample

In this part, I determine the sample size, the procedure of sample selection, and the timing of the test.

3.4.1 Sample size

A power analysis calculation (Cohen, 1988; Chmura Kraemer & Thiemann, 1987) was used to determine the sample size in the present research. There are two important measures to determine the sample size, power, and effect size. The power of a statistical test is the probability that the test provides significant results. The effect size is the difference between the means divided by the standard deviation. For

instance, it could be the means of the control and experimental groups. I selected a probability of 80 in 100 of finding an effect as recommended by Cohen (1988). I used correlation test at alpha 0.05 as the basis for determining the sample size. In similar research on young children, the range of the effect size was 0.4 to 0.7. The total sample size which was required for attaining the probability of 80 in 100 of detecting an effect of 0.4 was 198 children. The total sample size which was required for attaining the probability of 80 in 100 of detecting an effect of 0.7 was 66 children (power tables in Cohen, 1988). The total sample size of 198 children might be too large from an economical point of view. At the same time, it might be a risk to consider a high effect size such as 0.7 in behavioural sciences (effect size of 0.5 is recommended in Cohen, 1988). Bearing in mind such circumstances, with 3 groups as described below, I selected a group sample size of 50 with probability of 80 in 100. A total sample size of 150 could detect an effect size of 0.4 (Cohen, 1988, 1992).

3.4.2 Strategy of sample selection

I determined three important elements in sample selection. These are location of schools, participants in the research, and the timing of the fieldwork. Regarding the location of the schools, I selected a convenient sample to obtain support from educational institutes in Bahrain. I preferred to work with some primary schools and kindergartens in two large cities, Al-Manama and Al-Muharraq. These two locations are densely populated by individuals from a wide range of ethnic backgrounds including Arabs, Iranian, Pakistani, and others. Today, most of these nationalities gain Bahraini citizenship. Deducing from that, some groups in this population speak Arabic as a first language; whereas for others, Arabic is a second language. In addition, Arabs in these two locations speak Arabic with different dialects. Consequently, people in Al-Manama and Al-Muharraq differentiate in their socio economic background. Together, these factors have an influence on the level of schools in Al-Manama and Al-Muharraq. For instance, I asked a senior primary teacher to provide me with four children from grade 1 classes in her school. She mentioned there are no weak children in this school. When I repeated my request, she did select the children. She informed me that the selected children are weaker in their

attainment in comparison to their peers only; however, they are average. Consequently, the first grade's children in a primary school in Al-Manama might be higher in their level of achievement than the first grade children in another school in Al-Muharraq or even in another part of Al-Manama. In conclusion, I selected some public primary schools and private kindergartens from Al-Manama and Al-Muharraq.

In relation to selection of children, I asked each first grade class teacher (female) in the primary schools to determine the two children with the lowest level in their performance. The age of this group was around 7 years. Similarly, I asked each kindergarten class teacher to provide me with the two children she assessed as the lowest in their performance. These children were 6 years old.

The selected sample size for the initial phase of the research was 100 children. One-half of the sample was formed of children aged 5-6. These children were at the last stage in kindergarten. The other half of the sample was comprised of children aged 6-7. The children were in grade 1. They were selected from both boys and girls public primary schools. All children spoke Arabic language. The two halves of the sample formed group (1) "children with learning problems". The objective of this style of sample selection was to examine if the test could identify the children that have problems in reading, writing and numeracy. Later, it could help me to develop a practical and functional tool.

The timing of the screening was at the end of the annual year 2006-2007. I selected this timing to investigate if there is an appropriate time for detecting such problems.

In addition, I interviewed class teachers about the behaviour children might use to cover their problems. I called this part of the fieldwork phase one.

In phase two, I made contact with the schools in writing in order to investigate the performance of children with learning problems in the competencies of reading, writing and maths. I sent two forms. One form was to the senior teacher, and the other form was to the class teacher (see appendix 2). The evaluation at this stage is based on the primary school curriculum of grade 1 and 2 (see appendix 3 for the evaluation system). The timing of phase two was between April and June 2007.

In phase three, I applied the final version of the screening test developed in the study. I selected four of the primary schools I worked with before, two boys' schools and two girls' schools. The total number of children was 50. This time, I asked each class teacher to provide me with the top 5 children in reading, writing, and maths. I called this group the "typically developed children". At this time of the year, the first term was about to finish. During this phase, I interviewed 40 staff from the schools and primary education. The objective was to collect some information to interpret the results of the children with learning problems. In short, I selected a sample of 150 children, and I divided the sample into two main groups, "the children with learning problems" (group 1) and the "typically developed children" (group 2).

3.5 Test development

The test development consists of preliminary selection of the items for the test, pilot study, and the construction of final form of the test.

3.5.1 Selection of test items

During the literature review, I identified some factors which were found to predict young children's problems in reading, writing and numeracy. For instance, I came across some tests that were constructed in the field of literacy and numeracy. I chose phonological awareness, and concepts of print for the reading part of the test. In the phonological awareness part (Bryant & Bradley, 1987; Kirtley et al, 1989), I have constructed items such as:

1. A print of all Arabic letters. I asked the child to say the sound of each letter.
2. A task of three words. I said the words and asked the child to identify the two words that begin with the same sound.
3. A task of three words. I said the words and asked the child to identify the two words that end with the same sound.

In concepts of print part, I used some of Clay (1979, 2002) items, I asked the child to pick up one of the two storybooks (in Arabic language) and do the following:

a. Open the book.
b. Point at the beginning of the story.
c. Read the story.

d. Show me the story.

e. Show me the front and back of the book.

f. Show me some letters and words in the book.

In the writing part, I selected drawing of the human figure (Goodenough, 1926). I ask the child to:

a. Write his name.

b. Draw his favourite person.

c. Write a letter to this person.

d. Copy shapes

In the numeracy, I selected the assessment interview A from Maths Recovery (Wright, Martland & Stafford, 2003). It consisted of:

1. Forward number word sequence. For instance, I asked the child to say (1-32 and 48- 61).
2. Number word after. For instance, I asked the child to say the number word that comes after 14.
3. Numeral identification. For instance, I showed the child cards that had a number one at a time and asked him to say the number such as 10, 15 and 47.
4. Backwards number word sequence. For instance, I asked the child to count backward from 10 – 1 and 15 -10.
5. Number word before. For instance, I asked the child to say the number that comes before 24 or 17.
6. Sequencing numerals. For instance, I placed in front of the child randomly cards that contain numbers such as 46-55 and asked him to arrange them in sequence.
7. Additive tasks. For instance, I screened two collections of counters 4 and 5. I asked the child to say how many. During this time, I observed the child.

3.5.2 Pilot study

Two pilot studies were conducted. The first one was in October 2005. The sample consisted of 18 children from one kindergarten in Bahrain. The age of the children was 5-6 years old. During this study, I conducted one to one interviews with each child. I used the above-mentioned items. This interview was videotaped. During this

study, I was able to form an idea about the suitable level for these children. For instance, I found that saying the sound of each letter in Arabic alphabet was long and boring for the children. The items that have only words were difficult for the children too. The human drawing task seemed to be appropriate. I had a good experience of doing the numeracy tasks. I observed children's different ways of counting. For instance, some children always begin to count from 1 even if the task is to count from 48 to 61; also, I found that most of the children experienced difficulty in counting backward. I observed that some children used their fingers in the additive tasks. Others put their hands on the screen to feel the counters. Consequently, I selected three items from the phonological awareness part. I replaced the words by pictures. I kept concepts of print. I added copying four shapes (circle, square, triangle, and diamond) to the writing part. I selected only the additive tasks for the numeracy part.

The second pilot study was in February 2006. I interviewed two Arabic speaking children (a boy in third grade and a girl in first grade). These interviews were in Glasgow. I found some words were not familiar to them and some pictures were not clear. I replaced them with other words and pictures. Each interview took around an hour.

In summary, the two pilot studies were productive. They guided me to reduce the number of items in the test. I selected the most appropriate items for the age groups.

3.5.3 The final form of the test

This screening test is developed in Arabic language. It consists of three parts, reading writing, and numeracy (a translated copy of the test is in appendix 3).

3.5.3.1 Part one: Reading

The reading test composed of two sections, phonological awareness and concepts of print.

3.5.3.1.1 Phonological awareness

The phonological awareness section consists of three tasks. It includes most of the sounds in Arabic language with different markers (long and short vowel). The final form of the test and the administration procedure are as follow:

1. Test one contains some pictures of familiar objects that begin with different sounds. The first picture is an example. I showed the child a picture of a bed (screen the rest of the pictures on the paper. I say: "*This is sareer. Sareer begins with sa. Now I will say the name of another picture and I want you to say the first sound*". I introduced the picture of rabbit and I say: "*This is arnab. Could you tell me what is the sound you hear at the beginning of the word Arnab*" (provide the child enough time). The child responds. Then, I move to the second picture and so on. I avoid any feedback.

2. Test two consists of three pictures of familiar objects. The first three pictures are shown to the child. I say the name of each object. Then, the child will be asked to do the following: "*Could you tell me the two objects that have the same sound at the beginning*"? Pause. Child responds. Then, I say: "*What is this sound?*" Pause. Child responds. Then, move to the next task.
3. Test three consists of three pictures of familiar objects. The first three pictures will be shown to the child. I say the name of each object. Then, the child will be asked do the following:"*Could you tell me the two objects that have the same sound at the end*"? Pause. The child responds. Then, I say: "*What is this sound*"? Pause. Then, I move to the next task. The child gained a score of one for the correct answer, and zero for the incorrect answer.

3.5.3.1.2 Concepts of print

The aim of this task is to observe if the child comprehends that the written message can communicate. Two storybooks are placed on the table. I asked the following questions:

- "*Could you pick up one book and show me where the story starts*"?
  - *Show me the story?*
  - *Show me the front of the book?*
  - *Show me the back of the book?*
  - *Show me a letter?*
  - *Show me a word*? The child gained a score of one for every correct answer.

3.5.3.2 Part two: The writing test:

This part is divided into two tasks. The first task is on the drawing of a human figure. The second task is on copying four shapes.

3.5.3.2.1 Drawing of human figure

The child is asked to do the following: "*I want you to draw a person that you like the most (hints mother, father or a friend)*". If he finishes the drawing, I say: "*Now I want you to write a letter to this person*". I encourage the child if he/she says: "*I do not know*". Then, I say: "*I want you to write your name on the paper*?" A coding scheme was developed for the drawing, writing the letter, and name of the child as part of this research.

3.5.3.2.2 Copy shapes

The purpose of this task is to copy four shapes, a square, circle, triangle, and diamond. It is important to mention that in Arabic, children read and write from right to left. I place the circle in front of the child and say: "*This is a circle. I want you to look at this circle carefully, and then, draw it on this paper*". Then, I place the square and say the same and so on. The child gained a score of one for the correct action and zero for the incorrect one. A coding scheme was developed for evaluation of the drawing as part of this research.

3.5.3.3 Part three: Numeracy

This part is on additive tasks, a section in Mathematics Recovery Assessment. I used it to identify the strategy the children apply in their counting (Steffe et al. 1983; Steffe and Cobb, 1988; Wright, 1989; 1994; 1996). In these tasks, the materials are counters with two coloured sides, red and white, and two screens. Both the child, and I use the same table, and the child sits on my right side. The level of the table and the chair must be suitable to the child's level. It is important to give the child enough time, and encourage him to check his answer (for details see appendix 4).

3.6 Validity of the test

Validity means that the test measures what it supposed to measure (Rust, & Golombok, 1989; Hogen, 2007). Before I use the test with the children I consulted two experts in the field of education to provide me some comments on the test. The first expert was from Bahrain. She was a former primary teacher and an inspector in the first cycle of primary education. The second expert was from Libya. He is a lecturer in the curriculum at the university. I asked both experts to check whether the items in the test are appropriate for children aged 5 to 7. I requested them to revise the instructions and pictures for clarity and familiarity. I made some of the required changes.

3.7 Link between the items in the test and the curriculum in preschool and grade 1

In the preschool, there are no competencies. Accordingly, the first section shows the link between the items in the test and preschool activities. The second section shows the link between some items in the test and some competencies of grade 1.

Table 3-1 link between the items in the test and the activities of the preschool

Test items	Preschool curriculum and activities
Phonological awareness (task3) Identifying the shared sound at the end of two words	**Nursery rhymes** Expose children to their first names by writing the child's name on child personal items such as lunch box, glass, cabinet, paper work. Also calling the child using his first name
Concepts of print	**Story time with class teacher** 1. Usually a teacher holds a story book and asks the children to sit around her during reading a story. Children like to take the role of the teacher during play. They copy her actions in holding the book, turning the pages and use some of her words. 2. Book corner in the class. Children are free to select a book and turn the pages. Sometimes children ask the teacher to read some words which attract their attention.
Writing own name	**Fine motor** 1. Development of fine muscles in the fingers and coordination between hand movements and eye. Play with dough, drawing, colouring, threading beads, writing names and some letters. 2. A child is exposed to his name.

Copying shapes	Part of the preschool curriculum is to identify and draw circle square, triangle and rectangle. These are some of the activities they do in the preschool : 1. A teacher places in front of a child some toys which contain different Shapes. She asks to him to give her a circle. In a paper she will give the child a paper that contains several shapes. She asks him to colour the circles only. In another activity, she provides the child with a sheet of paper which contains few circles in dots. He will be asked to use a crayon or pencil and go over the dots to draw the circle. At the end he will be asked to copy the circle. Such activities are frequent. 2. There are activities on tracing, copying different stows which are useful in writing letters, tracing, copying and later writing some letters and numbers
Drawing of human figure	Most of the children like to draw people
Numeracy	During play children count blocks, beads, coins and other items. They do sorting and keep things in sequence based on size or events (build a tower). In the shop corner, thehildren take the roles of the casher and buyers. They use counters as coins.

Table 3-2 link between the items in the test and some competencies in grade 1

Items in the test	**Competencies in grade 1 curriculum (examples)**
Phonological awareness	• Sings short rhymes correctly • Blind learned letters and rime to construct or form new words A child is capable of using early literacy and verbal skills required for learning to read. 1. Identifies sounds and shapes of letters: 2. Says or pronounces the sound of a letter with its markers correctly. 3. Says or pronounces the sounds of letters with vowels correctly. 4. Says or pronounces silent and emphatic letters attached to other letters correctly 5. Connects between letter shape and its sound. 6. Differentiates letters that have similar shapes and sounds. 7. According to sounds he analyzes sentences into words and words into letters.
Concepts of print	• Recognizes pre-reading strategies from pictures or title. • Based on his previous experience he predicts the content of the text.

Copying shape, Drawing human figure, and writing a personal letter. Copying shapes and drawing a human figure are important skills for writing sentences. The child needs to plan before he begins the task. He needs to determine the starting point and the direction of hand movement. He needs to estimate the length of the line and its size in relation to other parts. All these actions are required in writing words. In writing the personal letter the child uses these skills and adds the rules of writing letters.	Acquires mechanics of writing. • Recognizes appropriate direction in drawing letters and words. • Uses acquired writing to write short sentences with Consideration of links between letters and spaces between words. • Recognizes pattern of arranging writing on a paper 1. Writes on the lines. 2. Leaves an appropriate margin on both right and left sides on a page. 3. Leaves appropriate space at the top and bottom of the page. 4. Blends learned letters and rime to construct or form new words. 5. Synthesizes (blend) sounds of words into sentences and sounds of letters into words.
Writing one's own name and a personal letter	Writes from short memory short complete sentence (around 3 sentences). • Write from short memory sentences that include familiar words. • Write from memory words about self, context (full name, school, class, country). Constructs in writing useful complete sentences from certain or restricted words (3- 4 words) • Expresses in one short sentence the content of a picture or situation based on his limited linguistic experience. • Applies his acquired knowledge of vocabulary appropriately in his writing. • Applies his acquired knowledge of linguistic construction correctly in structure or building sentences. • Copies a sentence that he read correctly.
Copying shapes	Understands some Geometrical concepts. • Identifies some areas such as square, rectangle, Triangle and circle. • Identifies and compares some models cube, and cylinder. Does some geometric construction using appropriate tools. • Constructs a model using areas and volumes.
Concepts of print, copying shapes drawing of human figure	Understands some location relationships • Determines the location of things in relation to each other (using concepts of in front, back, on, under, on the right, on the left, closer, farther, inside, outside....). Deals with main measurement units (length, time, currency). • Compares two things in terms of size such as big, small, and length long and short.

Numeracy	Develops sense of numbers • Estimates the number of things (around 11). • Determines the numerical relationship between numbers each of two digits based on the quantity. • Identifies number symbols 0-9. Extracts some relationships or generalizes simple mathematical relationships from provided data. • Uses observation to determine the criteria of a concept. • Discovers some simple mathematical patterns and expands them. • Explains what he does in order to solve a problem. • Determines the appropriate operation (+, -) based on certain indication and figures the outcome. • Solves a problem by following steps.

3.8 Method of the test application

This section consists of four parts. The first part is on the ethics procedure I followed before I conducted this research. The second part describes the method I used to collect the data. The third part is the interview schedule. The fourth part describes the setting of the interview.

3.8.1 Ethics in research of social science

It is important that a researcher obtains the permission of the people whom he or she wants to interview. He or she needs to make sure that the information will be secure and the people come to no harm during the research or after the completion of the research (British Education Research Association). Before I carried out my Data collection I completed an ethic application form for the ethics committee at the University of Strathclyde in order to receive an approval from the committee to do the research (see appendix 6).

In this research I worked with young children and adults. For the children, there are three issues that need clarification. First, I needed to work with young children aged 5-7. These children were not mature enough to make their own decisions. It is hard for them to identify things that might harm them. Also, I had to consider psychological aspects when I worked with them. At the same time, I needed to contact their parents or guardians to explain to them what I wanted to do with their

children, what would happen to the tapes and the information I collected after I had finished the research. Therefore, I used informed consent to address this subject.

The second issue is that I needed to work with each child in his kindergarten or primary school. In Bahrain, the Ministry of Education has its regulations for school and pupils contact. In the case of this research, I had to present an official document to explain my study. I provided the Ministry a letter from my first supervisor which indicates that I was doing my PhD in the University of Strathclyde, and data collection was part of the study requirement. I attached a copy of the test. I signed a declaration document that the collected information will be used for the purpose of this research only. I indicated that the information including the tapes will be destroyed after I complete the research. Eventually, I received a stamped letter from the Ministry which I presented to the school administration that I planned to contact. At this stage the school took full responsibility for everything which takes place in the schools. This included children's safety, education and decision making on their behalf. One of the school administrators said: "as long as the pupil is in the school, we take this responsibility". It seems that The Ministry of Education's approval is considered as consent for some administrators. I also sent the letters to the children's parent through school administrations. I collected the letters from the schools before I began the interviews to confirm that this had been done.

The third issue is that pictures or videos might be sensitive in some occasions. In this case, I was a stranger to parents. They did not know me and the subject is very sensitive. It might affect the child later on, if I did not keep the information confidential. It was important that parents were informed about such details and I was concerned that parents approved this issue.

Before I began the interview with each child, I explained to him what I was planning to do and I asked him if he would like to participate. All the children I interviewed showed interest in taking part. I tried to make sure that the child was comfortable during the interview and provided him with enough time. I conducted the interview in two sessions with the children who experienced difficulties. The gathered information was kept secure. When parents or teachers asked me about individual children's performance, I did not provide them with any information. Negative information might affect their perception of the children (see ethics form which was

completed in The University of Strathclyde and the letter of informed consent in appendix 5).

Regarding ethical issue for adults participants, people in Bahrain do not like to provide written consent. Therefore, I took each person's oral consent through phone or personal contact. I explained to them the purpose of the interview. I told them that this information will be kept secure, confidential, and will be used for the purpose of this research only. I fixed a suitable appointment with each individual.

3.8.2 Interview and observation

In the fieldwork, I conducted a one to one interview with each child in order to implement the screening test. The interviews were videotaped. There were several reasons for using the interviews and video tapes. First, these children were young and cannot read at this stage. At the same time, they were evaluated by their teachers as having problems in literacy and numeracy. Therefore, I used pictures instead of words in the reading part, which is on phonological awareness. Second, the test was structured in a way that I introduced the items to each child. Third, the additive tasks required to observe the child's behaviour in order to determine the child's strategy level in arithmetic. Fourth, the test required my full attention to the procedure, and to avoid any distraction. Not only that, but I was supposed to observe some negative coping strategies that the child might use during the interviews. In short, one to one interview and observation were appropriate for this research (Yon Lee et al., 1999; Roberts, et al., 2001; Damico, Nelson et al., 2008).

3.8.3 Interview schedule

In this research I interviewed children and adults; however, the children's interview is the main one. The following is the interview schedule with children.

No	Task	Time
1	**Reading** • Phonological awareness • Concepts of print	 • 12-20 minutes • 3-5 minutes
2	**Writing** • Copying shapes • Drawing human figure (includes writing own name and a letter)	 • 2-3 minutes • 15 minutes
3	**Numeracy** • Arithmetic tasks	 • 15 minutes

3.8.4 The setting for the interview

I sat with the child in a quiet room with a small table in front of us. The child sat on my right. I tried to make sure that he was comfortable on the chair. The camera was placed in front of us. All the materials were kept on a small child on my left away from the child sight. As soon as I finished from a task, I removed the related materials away from the table to avoid any distraction. Before starting, I introduced myself to the child, and asked him for his name. I had a friendly talk with the child. Then, I told him: "*I came to your school to do some activities with some children. I have letter sound game, storybook, papers for drawing and these round counters for counting game. I want to work with you. This is a video camera in front of us. I will use it to tape myself and you while we are playing together. After that, I am going to show you the tape*". Later I asked each child if he wanted to participate in these activities I only conducted the interview with the child who said yes. During this interview, I tried to ask the child to raise his voice, but still the voice was very low. In future, I am planning to place an additional microphone on the table. Unfortunately, I lost some data while processing CDs, and I did not have the video tapes backed up. Next time, I am planning to keep all the original tapes. Another thing, I will try my best to have another person to operate the camera, and zoom in and out when it is needed.

3.9 Scoring and coding

In this research, I developed my own scoring, and coding system except for the additive tasks, I used Maths Recovery coding (Steffe et al. 1983; Steffe & Cobb, 1988; Wright, 1989; 1994; 1996). I put scores for each item in the parts of reading, the phonological awareness, and concepts of print. In the writing part, I developed a coding system for writing one's own name, drawing a human (Goodenough, 1926; Leo, 1970; Cox, 1991, 1992, 1993, 1997), writing a letter, and copying shapes. I paid attention to stage of the development in the coding.

3.9.1 Scoring and coding for the child's name

The child's own name, the child is placed in a category based on the detailed presented in the following table:

Category	Details of writing own name
0	Scribbles or scattered letters which are not recognized as a child name .
1	The name is recognized, but missing one letter or more. The size is big and a large space is left between letters. The name may or may not be on a horizontal line.
2	The child can write his name in a clear handwriting. All letters are present on a horizontal line or almost on horizontal line. A suitable space is left between letters. The name is in a usual size.

3.9.2 Scoring and coding for the drawing of human figure

Stage	Stage name	Details
0	Scribble	No drawing, overlap lines, scattered shapes and unrecognized features of a creature.
1	Tadpole	Minimal circular head with eyes and mouth and vertical line for legs.
2	Transition	Circular head, legs longer, torso between the legs and arms attached to it (not to be mixed up with long cloths that is related to culture). Sometimes the horizontal line is not present line.
3	Convention	The figure contains head, neck, trunk, arms and legs. The head contains eyes, mouth and nose, may be hair, gender and cloths.

3.9.3 Scoring and coding for the child's letter

In relation to writing a letter for a favourite person, I used three criteria. The child must:

a. Write on a horizontal line
b. Write from right to left as required in Arabic language
c. Produce communicative meaning.

In no.3, if the child produced lines, shapes or not cleared letters, he received a score of 0. If the child wrote some letters, he or she received a score of 1. In the case of grouping some letters into words either have no meaning or meaning he received a score of form 2. However, if the child wrote one sentence or more with meaning he received a score of 3. Next, the child was placed in a category based on the three previous criteria and it is as follows:

Category	Horizontal	R to L	Communicative meaning	Form
0	X	X	X	0
1	X	√	X	1
2	√	√	X	2
3	√	√	√	2
4	√	√	√	3

3.9.4 Scoring and coding for the shapes

In copying shapes, the child is placed in a category based on his skill in copying the two oblique shapes, triangle and diamond. The two shapes are defined as:
Triangle: Is a shape that consists of three lines joined together to form three angles. At least two of these lines are oblique and two of the angles are acute.
Diamond: Is a shape consisting of four lines joined together to form four angles. All these lines are oblique and almost equal in size. Each two opposite angles are from the same type. The coding is as follows:

Category	Details
0	Cannot draw both oblique shapes (triangle and diamond)
1	Can draw only triangle.
2	Can draw both triangle and diamond shapes

According to developmental measures, the norm for the shapes is:

Shape	Age norm
Circle	36 months (3 years)
Square	54 months
Triangle	60 months
Diamond	7 years

3.9.5 Scoring and coding for stage of early arithmetical learning

In additive tasks, I used the coding system for the stages of early arithmetical learning in maths recovery to categorize the strategies used by children. These are:

Stage no.	Stage name	Description
0	Emergent counting	At this stage, children have problems with counting visible items. Either they do not have 1:1 correspondence or they do not actually know the number words or the correct sequence.
1	Perceptual counting	At this stage, children can count what they can see, hear, or feel but they have problems counting hidden items. This is because they have difficulty in visualizing or representing the items to themselves.
2	Figurative counting	At this stage, children can count hidden items, but they use concrete markers to represent items to themselves. These markers can be fingers, body movement, objects, or words. They usually use a count-form-one strategy when adding.
3	Initial number sequence	At this stage, children are beginning to use an abstract representation of number that is not always connected to concrete markers. Because of this, they are able to use a count-on strategy when adding. They can use simple versions of countdown strategies for subtraction, but cannot count down to a pre-decided number.

3.10 Reliability for coding and classification of coping strategies

Reliability means the test provides the same results when it is used by other researchers under the same conditions (Rust & Golombok, 1989; Hogen, 2007). In the reading part of the test, the items have interval scores; whereas in writing and counting items are ordinal. I used observer agreement, and Cohen's kappa (Bakeman & Gottman, 1997) to determine the reliability for the coding system that I developed for the writing part of the test. I selected 32 cases in order to calculate the reliability. A fellow PhD student specialized in assessment and fluent in Arabic language served as inter-rater. I used examples of the children's work on writing their own names, to

show her how to score it using the coding scheme I developed for this purpose. Then, I provided her with the data from 32 children on writing their own names, and asked her to score the data. I told her if she was not sure how to score any name, she could put the paper a side, and ask me later. I did provide her an example on scoring the children's work on drawing of the human figure, writing a personal letter and copying shapes. The results showed that the items in the writing test were reliable. These were as follow:

Task	Percentage of agreement reliability	Cohen's kappa %
Drawing human figure	84.37	69.50
Child's name	93.70	93.10
Child's letter	81.25	73.20
Copying shapes	96.70	94.70

Regarding the counting strategy, I had experience with the various strategies children used in their counting from the maths recovery-training course.

For the negative coping strategies, a psychology lecturer with a PhD who has researched and published extensively in coping strategies served as inter-rater for coping strategies. First, I provided him with the definition of the coping strategy and a list of coping behaviours and asked him to identify which ones are coping strategies. I found 98 % agreement on the coping strategies. I removed the ones we did not agree on. Then, I provided the rater with a list of the coping strategies and the definitions of the "on task" and "avoidance" coping strategies. I asked him to classify the coping strategies into two groups based on the definitions. I found 100 % agreement on the grouping. We agreed on the idea that when a pupil uses the "on task" coping strategy, it means that he is still working on the task. He is trying to find a solution, and it does not mean he solves the academic task. If the pupil has solved the academic task it is not a coping strategy.

3.11 Interviews with adults

I conducted a series of interviews with teachers from schools during both the first phase and the third phase.

3.11.1 First phase (T1 interviews with class teachers)

During the first phase of data collection, I interviewed 12 class teachers in the primary schools. The interviews were either in small group or individuals. The purposes of these interviews were to investigate the following questions:

- Are teachers aware that some children use some coping strategies during learning tasks? If yes
- What are some of these observed tactics or coping strategies?
- Did they link these behavioural startegies to the child's problem in a particular task (the one that he is working on)?

In the beginning, when I asked the teachers: "*Do you think that some children use tricks or do things to cover their learning problems*"? They did not understand what I meant. I gave them an example, a child might hold a book, and pretend to read, but he recites the text from his memory. Then, they said yes, some children do that. They gave me some examples of these tactics or coping strategies. These will be mentioned in the results in chapter 5 of this thesis.

3.11.2 Third phase (T3)

During this phase, I interviewed around 40 persons from the primary schools I worked in during data collection. I used one to one interview, and the interviews were not taped. The participants were:

- Schools principals (n=5)
- Social workers (n=8)
- Special needs teachers (n=4)
- Class teachers (n=24)

3.11.2.1 Interviews with school principals and class teachers

The purpose of this interview is to collect information on the policy of assessing children. I wanted to know the views of the participants on this subject.

3.11.2.2 Interviews with class teachers and special education teachers

The purpose is to enquire about some terms which I used in the test such as the sound of the letter, front of the book, and back of the book. I enquired about some children who did very poorly in the test, but reached the expected level of competency on the school outcome which I received in May 2007. I asked the class teachers and special education teachers about the performance of these children.

3.12 Data analysis

In the quantitative part of the collected data, I used item analysis (point biserial correlation, Cronbach's alpha), item difficulty and descriptive statistics to determine the reliability. For the validity, I used chi square test, t test, and an additive risk model. I used the additive risk model to explore predictive validity, and to investigate the possible risk factors that caused the learning problems in young children. This model was used to study adolescent delinquency (Rutter, Cox, Tupling, Berger, & Yule, 1975, Dodge & Pettit, 2003). It is based on the assumption that it is (Dodge & Pettit, 2003: 354) *"the number of risk factors, more so than any single kind of factor, that increments risk"*. The model is based on the concept of equifinality, which is where the same event accumulates due to various factors. The extent of risk is related to the number of risk factors that exists. There are two assumptions regarding that:

- If the risk is referred to as probability, the chance of having the event increases as the number of risk factors increases. The process that produces an antisocial event might include one factor only, but this factor may not be the same for all children. In this case, the existence of this process is activated by involvement of more risk factors.
- A child's experience as a whole might change with introduction of more risk factors. In this case, the event is a product of the sum of all the factors. The effect of any intervention will be reduced as more risk factors join the process, and the total sum of factors takes the responsibility of the event.

The idea of this additive risk model received empirical support (Ackerman, Schoff, Levinson, Youngstrom, & Izard, 1999; Jessor, Bos, Vanderryn, Costa, & Turbin, 1995). In 1998 (Deater-Deckard, Dodge, Bates, & Pettit), a study on preschool

children found that 18 risk factors tend to predict future conduct problems. Furthermore, it was found that a problematic temperamental tendency that involved a range of risk factors (at age 6 months, low socioeconomic status at birth, early life experiences of physical abuse and peer rejection in early elementary school) together predict significant conduct problems in adolescence. On the other hand, the children who did not have any of these factors had a low risk of presenting 57% of conduct problems, the children with one factor had a moderate risk of 11% to 30%, and children that had all the four factors had a severe risk of 57% conduct problems in adolescence (Whitehurst & Fischel, 1994).

This additive risk model was used by Whitehurst and Fischel (1994) to demonstrate concurrent impairments in language domains had an additive effect upon the persistence of language delay. Thus, difficulty in one area of language such as phonology was associated with more positive outcomes; whereas concurrent in further additional areas, such as syntax or comprehension was associated with much poorer outcomes. National Council of Teachers of Mathematics(2000, 2006) found that children who were had more than one risk factor in the preschool had significantly lower achievement in grade three than children with no risk factor. They began the preschool with fewer entry-level skills.

In summary, the previous review of research showed that the additive risk model could be used to identify the accumulated risk factors that could predict conduct problems and language delay in the future.

The additive risk model and predictive validity are both concerned with future prediction of problems. Both procedures are involved with a number of something in the present that predict something else (problem) in the future. For instance, for the predictive validity, the required data are:

1. Scores of children on the test (low / high on phonological awareness or concepts of print) or writing or numeracy or any combination of these)
2. School outcomes which are the teachers' evaluations of children on school competencies at the end of the year 2006-2007 (non-competent / competent in reading or writing or numeracy or an appropriate combination to match the scores).

I explored the utility of this model for determining the predictive validity of the test by examining the extent to which cumulative difficulties in subtests would discriminate between children with difficulties and their typically developed counterparts. I used the following contingency table (Butler, 1988).

Item	None competent	Competent
Low score	A	C
High score	B	D

Specificity = a / a + b = % , sensitivity = d / c + d = %

Two terms are important in this analysis. These are sensitivity and specificity. Sensitivity is (Butler, 1988:2) "*The test's capacity to identify children truly affected by the condition*". The lower the sensitivity the fewer children with the disorder will be correctly identified. Specificity is the (Butler, 1988:2) "*capacity of the screening test to identify children, who are not truly affected by the disorder*. The lower the specificity, the fewer typically developed children are correctly identified. It means that unaffected children would be inappropriately followed up for further assessment. Applying this to the additive risk model I have:

1. Children with difficulties in one or more areas of the test, children with no difficulties (here I replaced scores with presence or absence of problems). The problem is the area of the test such as phonological awareness.
2. For each child, I received a teacher report of their competencies in the school curriculum. The cut off in this case is the number of the problems (few problems or more problems instead of low or high score). Then, I used the contingency table in the same way to find the specificity and sensitivity, but I replaced low with no difficulty or less/ difficulty in one or more.

For investigating the most appropriate timing for test administration, I used item analysis (Varma, 2006) and t test (Field, 2005; Pallant, 2007).

For the qualitative analysis I used inter-rater agreement to determine the reliability of the coping strategies.

3.13 Summary:

In the present chapter, I described the procedure that I followed to construct a test to screen young children's learning problems in reading, writing and numeracy. I selected correlation and item analysis as an appropriate research design. I collected some appropriate items that I could use in the development of my screening test. In reading I found that both phonological awareness and concepts of print are important in the development of reading. Writing own name and writing a letter could show if writing has a meaning and make sense for the child. Drawing a human figure and copying shapes provide indication of cognitive development and motor skills. In numeracy I used the additive tasks from Maths Recovery. The additive tasks show how advanced the child's strategy in counting is. Then, I selected my sample and set up a schedule for the research.

Unexpected events occur: in the case of this research I changed the timing of the first data collection from Feb 2006 to May 2006, and continued until Oct 30th 2006; also the children who were evaluated by teachers as having problems, most of whom scored low on the test, did progress to a higher level in the school. In such situation a researcher has to change the research plan. Therefore I decided to carry out further data collection and work with typically developed children selected by class the teachers to investigate the specificity of the test. The typically developed children scored highly on the test. The results helped to confirm the levels of difficulty of the test and teacher evaluations of the children participating in the research. At the time, I talked with some of the staff in the schools and in the primary administration in order to find explanations for the children's progress.

4 Results 1

4.1 Introduction

The focus of this chapter is the quantitative analysis of the collected data. For the reliability of the test, I used Cronbach's Alpha to investigate the internal consistency in the test. I ran an item analysis to determine the quality of the items in the test (Varma, 2006). I used two types of item analysis, point biserial correlation with associated item difficulty; I used also item difficulty and descriptive statistics to describe the children's performance on the test. For validity, I used measures of predictive validity and concurrent validity. I used the additive risk model mentioned in the previous chapter (Dodge & Pettit, 2003; Whitehurst & Fischel, 1994) to determine the predictive validity of the test, and explore the risk factors that may lead to future learning problems in young children. I followed that by using the concurrent validity. I applied point biserial correlation and chi square tests. Finally, I compared the performances of grade 1, and preschool children on the test to investigate the most appropriate timing for the test administration.

4.2 Reliability of the test

I used two types of item analysis to determine the reliability of the test used in this research. The first one is point biserial correlation and the other is item difficulty (Howitt & Cramer, 1997; Rust, & Golombok, 1989; Hogen, 2007).

4.2.1 Item analysis using item - total correlation

Item analysis is used to determine the internal consistency in the test. It is to make sure that all the items in the test correlate with the sum of the items in the test.

Table 4-1 Item analysis for the items in the test when sound of a letter only (n=95)

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	if Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted	Item diff.
1. Identify the initial sound a word	3.95	4.42	0.46	0.69	0.64
2. Identify the shared sound in the beginning of 2 words	4.52	5.32	0.25	0.72	0.07
3. Identifying the shared sound at the end of 2 words	4.54	5.29	0.34	0.72	0.05
4. Identifying the front part of the storybook	4.43	4.91	0.40	0.70	0.16
5. Identifying the back part of the story book	4.44	4.95	0.39	0.71	0.15
6. Identifying some letters	4.00	4.50	0.45	0.70	0.59
7. Identifying some words	4.13	4.73	0.33	0.72	0.46
8. The child's strategy in the arithmetic task	4.48	5.21	0.27	0.72	0.11
9. Human drawing of a favourite person	3.80	4.91	0.31	0.72	0.76
10. Copying shapes	4.45	5.19	0.25	0.72	0.14
11. Writing own Name	3.80	4.79	0.40	0.70	0.78
12. Writing a letter	3.91	4.49	0.50	0.69	0.68

The results in Table 4-1 are for group 1. Group 1 is the group of children with learning problems. It consists of preschool children and grade 1 children. The results in the table present the case, when only the sound of a letter is to which the items measured the same construct by looking at the effects of removing each item in turn. If removal of an item markedly improved the overall internal consistency of the test it can be concluded that it is measuring some other construct and should be removed. I determined the internal consistency among the items in the test using Cronbach's Alpha. I tried to remove one item at a time and checked the Cronbach's Alpha. As the average inter-item correlation increases Cronbach's Alpha increases. I continued doing that until I got the highest possible Cronbach's Alpha. I found that the highest test reliability was 0.73, when the remaining three items holding the storybook, and opening it, identifying the story in the book, and beginning reading from right to left were removed from the test. I used Cronbach's Alpha to show how well the items in

the test measure a single one-dimensional latent construct. If Cronbach's Alpha value is above the satisfactory level 0.70, it means that the items measure the same construct and the test is reliable. Column 3 in the table shows the point biserial correlation. This correlation is appropriate for my data because I had right/ wrong scores in concepts of print section, and the children's outcomes on competencies of reading, writing, and numeracy were also dichotomous (yes/no). The point biserial correlation determines the quality of the items in the test that is the extent to which they measure the same construct. The point biserial values for most of the items in column 3 were above the satisfactory level of intended consistency reliability 0.25. The results show that the items in the test were of good quality (Varma, 2006; Rust, & Golombok, 1989; Hogen, 2007).

Column 5 displayed item difficulty. It refers to the percentage of people who answer an item in the test correct. In most tests item difficulty is in the range 0.30-0.70 (Kaplan & Saccuzo, 2005; Howitt & Cramer, 1997; Hogen, 2007). Item 3 is very difficult for the children; but it was of good quality, and removal of this item resulted in a decrease in Cronbach's Alpha value. It means it measures the same construct as other items.

I calculated item difficulty to explore how difficult the items were for group (1). In column 5, one could observe two criteria. First, the values were distributed across the whole range 0 to 1. Second, there was more concentration towards the centre. These two criteria increased the reliability of the test (Varma, 2006). Although the children experienced difficulties on items 4, 5, 8, and 10, these items had good quality, and the quality of the items was more important than the items' level of difficulty.

Table 4-2 Item analysis for the items in the test when sound or name of a letter (n=95)

Item	Scale Mean if Item Deleted	Scale Variance If Item Deleted	if Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted	Item diff.
1. Identify the initial sound or name of the letter in a word	4.10	5.10	0.12	0.72	0.96
2. Identify the shared sound or name of the letter in the beginning of 2 words	4.83	4.40	0.39	0.69	0.20
3. Identifying the shared sound or the name of the letter at the end of 2 words	4.98	4.80	0.34	0.70	0.06
4. Identifying the front part of the storybook	4.87	4.50	0.38	0.69	0.16
5. Identifying the back part of the story book	4.88	4.55	0.36	0.69	0.15
6. Identifying some letters in the storybook	4.45	4.06	0.46	0.68	0.58
7. Identifying some words in the story book	4.58	4.18	0.39	0.69	0.45
8. The child's strategy in arithmetic tasks	4.93	4.72	0.30	0.70	0.11
9. Human drawing of a favourite person	4.27	4.46	0.32	0.70	0.76
10.Copying shapes	4.90	4.73	0.25	0.71	0.14
11. Writing own name	4.24	4.40	0.38	0.70	0.79
12. Writing a letter	4.35	4.17	0.44	0.68	0.68

Table 4-2 is the same as Table 4-1 except in this case, the sound or the name of a letter was accepted as a correct answer in items 1, 2, and 3. The highest test reliability was 0.71, when the same three items were removed. In column 3, all the values of point- biserial correlation for the items in the test were satisfactory and above satisfactory except item 1. Item 1 was problematic for the children. It is less than 0.25, the satisfactory level. The item needs a review, and it is better to remove it from the test to maximize overall reliability.

In relation to item difficulty on column 5, the results show that item 3 was very difficult for the children. This means it measured different construct than the other items. It is possible that the children did not have previous experience in identifying either the shared sound or the name of letter at the end of two words. Item 1 was very easy, because the children had choices. In Arabic language, a letter has only one name, but several sounds. An answer that showed a child's familiarity with the letter was accepted as a correct answer. Adding to that, some children used guessing to answer this item. It is better to revise item 1 or remove it from the test. The spread of item difficulties values in Table 4-2 implied an increase in the reliability (Varma, 2006).

Looking at the two Tables 4-1 and 4-2, the items in Table 4-1 had a higher internal consistency among them than the items in Table 4-2. In Table 4-1, the point biserial correlations were consistent, indicating that the items measured the same underlying construct. Selecting the sound as a correct answer increased the quality of the items. Identifying the sound of the letter as an item provided the test with a higher reliability than selecting either the sound or the name of the letter as the correct answer for group 1. I selected identifying the sound as an item in the test. Overall, the test with the removal of item 3 achieved an acceptable level of internal consistency reliability for an instrument of this type (Rust, & Golombok, 1989).

4.2.1.1 Item difficulty for the tasks in the test

I analysed item difficulty to investigate whether the sub items in each task were easy or difficult for the children. As in Table 4-3, I determined item difficulty for the items in task 1 in reading by dividing the number of correct answers of the group of children (preschool or grade 1 in the group of children with learning problems) on each item in task 1 by the total number of children in each group. In this task I considered item difficulty of 0.30 as satisfactory (Kaplan & Saccuzo, 2005; Howitt & Cramer, 1997; Hogen, 2007).

Table 4-3 Item difficulty for task (1) on phonological awareness for the children with learning Problems (n=95)

No	Item	Preschool # of correct ans.	Preschool Item diff.	Grade 1 # of correct ans.	Grade 1 Item diff.	Total sample # of correct ans.	Total sample Item diff.
1	ə (أ)	34	0.72	36	0.77	70	0.74
2	Bə (بـ)	4	0.09	14	0.30	18	0.19
3	ʊ (عُ)	2	0.04	7	0.15	9	0.09
4	Baa (با)	2	0.04	9	0.19	11	0.12
5	ta: ə(طا)	23	0.49	32	0.68	55	0.58
6	aə(عَ)	23	0.49	36	0.77	59	0.62
7	θU: (ثُو)	5	0.11	11	0.23	16	0.17
8	f I: (فِي)	15	0.32	14	0.30	29	0.31
9	kI : (قِ)	6	0.13	18	0.38	24	0.25
10	ʃa (شَ)	21	0.45	32	0.68	53	0.56
11	hI : (حِي)	6	0.13	16	0.34	22	0.23
12	fU : (فُو)	8	0.17	27	0.36	23	0.24
13	kI : (كِ)	7	0.01	18	0.38	25	0.26
14	Wə (وَ)	22	0.47	30	0.64	52	0.55
15	Ta (تـ)	2	0.04	13	0.28	15	0.16
16	dI: (دِي)	10	0.21	9	0.19	19	0.57
17	SU (صُ)	22	0.47	31	0.65	53	0.56

Task 1 is composed of 17 items. The child was asked to identify the initial sound or phoneme in a word. The results in Table 4-3 show that grade 1 children performed better than both the preschool children and the total sample on task 1 of phonological awareness.

Table 4-4 Item difficulty for task (2) on phonological awareness for the children with learning problems (group 1 n=95)

No	Item	Preschool # of correct ans.	Preschool Item diff.	Grade 1 # of correct ans.	Grade 1 Item diff.	Total sample # of correct ans.	Total sample Item diff.
1	Bə(بـ	5	0.11	14	0.30	19	0.20
2	ʃa:(شا)	4	0.09	11	0.23	15	0.16
3	Mə (مـ)	1	0.02	5	0.11	8	0.08
4	Nə (نـ	1	0.02	20	0.43	21	0.22
5	R ə(ر)	0	0.00	4	0.09	4	0.04

The results in Table 4-4 are for task 2, which is identifying the shared sound (phoneme) in the beginning of two words. The results show that task 2 was very

difficult for the preschool children with learning problems. Grade 1 children with learning problems performed better than the preschool children and the total sample.

Table 4-5 Item difficulty for task (3) on phonological awareness for the children with learning problems (group 1, n=95)

No	Item	Preschool # of correct ans. /Item diff.		Grade 1 # of correct ans. / Item diff.		Total sample # of correct ans. / item diff.	
1	r ə(ـَ)	1	0.02	4	0.09	5	0.05
2	nə(ـَ)	0	0.00	4	0.09	4	0.04
3	zə(ـَ)	2	0.04	5	0.11	7	0.07
4	Ka(ـَ)	0	0.00	12	0.26	12	0.13
5	Su(ـَ)	5	0.11	13	0.28	18	0.19

The results in Table 4-5 are for task 3 which is identifying the shared sound at the end of two words. The results show that task 3 was very difficult for all the children with learning problems. All the item difficulties values were below 0.33. The item difficulties for the preschool children on 4 items were below 0.1 which means the tasks were very difficult for the children. The item difficulties for grade 1 children with learning problems on the first two items were below 0.1. This means these two items were the most difficult for grade 1 children. In relation to the total sample, the item difficulties for the first three items were below 0.1. This means these items were the most difficult items for the total samples. It can be concluded that identifying the shared sound at the end of two words was the most difficult task in reading for all the children with learning problems.

Table 4-6 Item difficulty for concept of print items for the children with learning problems (group 1, n=95)

No	Item	Preschool # of correct ans./ Item diff.		Grade 1 # of correct ans./ Item diff.		Total sample # of correct ans. / Item diff.	
1	Identify the front	1	0.02	14	0.29	14	0.15
2	Identify the back	1	0.02	13	0.27	15	0.16
3	Identify letters	24	0.51	32	0.67	56	0.59
5	Identify words	18	0.38	28	0.58	44	0.46

In Table 4-6, the results show that preschool children with learning problems (group 1) found it very difficult to identify the front, and the back of the storybook. Overall, grade 1 children with learning problems (group 1) performed better than the preschool children and the total sample on concepts of print.

Table 4-7 Item difficulty in writing and numeracy items for the children with learning problems (group 1, n=95)

No	Item	Preschool # of correct ans. /Item diff.		Grade 1 # of correct ans./ Item diff.		Total sample # of correct ans./ Item diff.	
1	Circle	43	0.91	47	0.98	90	0.95
2	Square	14	0.30	15	0.31	29	0.31
3	Triangle	33	0.70	42	0.88	8	0.79
4	Diamond	9	0.19	15	0.31	21	0.25
5	Oblique	4	0.09	9	0.19	4	0.14
6	Human drawing	31	0.66	41	0.85	8	0.76
7	Write own name	33	0.70	41	0.85	21	0.78
8	Write a letter	19	0.40	46	0.96	4	0.68
9	Numeracy	2	0.04	8	0.17	4	0.11

The results in Table 4-7 show that the numeracy tasks were difficult for all of the children with learning problems (group 1). It is the most difficult task for the preschool children with learning problems. Copying both oblique shapes (triangle and diamond) were the most difficult shapes for all the children with learning problems. Copying the diamond was more difficult than copying the triangle. Grade 1 with learning problems performed better than the other two groups on copying shapes, drawing of a human figure, writing their own names and writing a letter.

I used the data of the two groups of children, group (1) children with learning problems and group (2) the typically developed children. I performed a t test for interval scores and chi square tests for both nominal and ordinal scores to see if there was a difference between the two groups' performances in order to interpret the results of group (1) on item difficulty.

Table 4-8 comparison between children with learning problems (group1) and the typically developed children (group 2) on total score o test variables(n=145)

No	Variable	Group	n	Mean score	S.D	Test
1	Phonological awareness	group (1)	95	7.15	4.74	t (141.99) = -31.85**
		group (2)	50	25.58	2.22	
2	Concepts of print	group (1)	95	1.04	0.95	
		group (2)	50	2.65	1.40	X2 = 17.17**
3	Writing	group (1)	95	2.36	1.14	t (135.42) = -10.83**
		group (2	50	3.80	0.45	
4	Numeracy	group (1)	95	0.11	0.31	t (137.35) = -20.23**
		group (2)	50	0.98	0.20	

* Correlation is significant at .05 level (2 tailed)
** Correlation is significant at .01 level (2 tailed)

The mean scores in Table 4-8 indicate that group (2), the typically developed children, performed better than group (1), the children with learning problems, on the four test variables. Both the t test and chi square tests show that group (2) achievement was better than group (1) achievement. The item difficulty results did not indicate that the items were very difficult for the children with learning problems, but rather the results show that the test was able to detect the children with learning problems.

4.2.2 Descriptive analysis for some sound of Arabic letters in task (1)

This part of the chapter contains descriptive statistics for both the preschool children and grade 1 children with learning problems on task 1.

Table 4-9 Descriptive statistics for the sounds of letters in Arabic for preschool with learning problems (group 1, n=95)

No	Sound	Mean score	Median	Std. Deviation
1	ă (ا)	0.72	1	0.45
2	b (بُـ)	0.09	0	0.28
3	(no equivalent sound)(عـ)	0.04	0	0.20
4	b (بـا)	0.00	0	0.15
5	H``(طـا)	0.49	0	0.51
6	(no equivalent sound) (عـَ)	0.49	0	0.51
7	Th (ثـُو)	0.11	0	0.31
8	f (فـِي)	0.32	0	0.47
9	q (قـِ)	0.13	0	0.34
10	sh (شـَـ)	0.47	0	0.50
11	(h``)(حـ)	0.13	0	0.34
12	m (مـِ) or f (فـُو)	0.17	0	0.38
13	k (كـِ)	0.15	0	0.36
14	w (وَ)	0.47	0	0.50
15	t (تـَـ)	0.06	0	0.25
16	th (ذِي)	0.21	0	0.41
17	s`(صـَـ)	0.47	0	0.50

The results in Table 4-9 show that the preschool children with learning problems (group 1) had difficulties with almost all the sounds. The mean score was above average only on the sound of the first letter in the Arabic alphabet. The median is reported to show that 50% of the preschool children were unable to score on item 2-17 which means the items were very difficult. Items 3 and 4 were the most difficult sounds for the preschool children.

Table 4-10 Descriptive analysis for the sound of letters in Arabic for grade 1 with learning problems group 1, n=95)

No	Sound	Mean score	Median	Std. Deviation
1	ă (ا)	0.76	1	0.43
2	b (بـ)	0.28	0	0.46
3	(no equivalent sound)(عـ)	0.15	0	0.36
4	b (با)	0.22	0	0.42
5	th`` (طا)	0.70	1	0.47
6	(no equivalent sound) (عـ)	0.80	1	0.40
7	Th (ثـو)	0.24	0	0.43
8	f (فـي)	0.30	0	0.42
9	q (قـ)	0.39	0	0.49
10	sh (شـ)	0.67	1	0.47
11	(h``)(حـ)	0.35	0	0.48
12	m (مـ) or f (فـو)	0.33	0	0.47
13	k (كـ)	0.39	0	0.49
14	w (وَ)	0.65	1	0.48
15	t (تـ)	0.26	0	0.44
16	th (ذ ي)	0.20	0	0.40
17	s`(صـ)	0.47	1	0.47

The results in Table 4-10 show that grade 1 children with learning problems (group 1) experienced difficulty with 6 sounds of letters in the task. The median indicates that 50% of the children had difficulties with 9 sounds. In Tables 4-9 and 4-10, the median show that 50 % of the preschool children had more difficulty than the grade 1 on items 5, 6, 10, 14, and 17. Overall grade 1 children with learning problems performed better than the preschool children with learning problems on task 1 in reading.

4.3 Validity for the test

A test is valid if it measures what it is intended to measure (Domino & Domino, 2006; Rust, & Golombok, 1989). For this test, I ran analyses of criterion related validity. In criterion related validity, I used analyses of predictive validity and concurrent validity (Rust, & Golombok, 1989; Cronbach 1990, Hogen, 2007). In addition, I used construct validity.

4.3.1 Criterion related validity

In this part I discuss the validity of the test using the predictive and concurrent validity.

4.3.1.1 Predictive validity

The additive risk model is a simple and practical method to investigate areas of problems in children's performances without using statistical software. Before going into details about this procedure, finding the predictive validity for the test, and investigating the risk factors; it is important to define both sensitivity and specificity. Sensitivity is the test capacity to identify children with a problem such as learning problems in this research (Butler, 1988). The higher the sensitivity the more children with learning problems will be correctly identified and the fewer the false negative cases. The false negative cases are the children with learning problems, where the test identified them as typically developed. Specificity is the capacity of the test to identify children without a problem (Butler, 1988). The higher the specificity, the more typically developed children were correctly identified, and the fewer the false positive cases. The false positive cases are the typically developed children which the test identified as having learning problems. It means that typically developed children would be inappropriately followed up for further assessment. This procedure is useful in identifying both false positive and false negative cases. In the additive risk procedure I used the data for grade 1 children in both group (1) and (2) only because I had data for these two groups.

The present test consists of four areas:

- Phonological awareness
- Concepts of print
- Writing part
- Numeracy

Adding to that, I used the "school outcomes" in reading, writing and maths. These are teacher's evaluation of the children at the end of the year.

Table 4-11 Predictive validity and factors for future persistence learning problems in reading (n=98)

Area of the test	# of cases no Progress	# of cases progress
Difficulties in any one or more areas	17	48
No Difficulties on the test	0	33
Sensitivity = 14/17 = 82.4 %		
Specificity = 33/81 = 40.70 %		
Difficulties in any two or more areas	14	27
No difficulties or difficulties in any one area only	1	54
Sensitivity = 14/15 = 93.3 %		
Specificity = 54/81 = 66.6 %		
Difficulties in any three or more areas	7	9
No difficulties or difficulties in less than three areas of the test	5	68
Sensitivity = 7/12 = 58.3 %		
Specificity = 68/ 77 = 88.3 %		
Difficulties on all four areas	3	7
No difficulties or difficulties in three or fewer areas	13	79
Sensitivity = 3 / 16 = 18.8 %		
Specificity = 79 / 86 = 91.9 %		

The results in Table 4-11 illustrate using a criterion of problems in two areas rather than just one optimised sensitivity and specificity for reading. The acceptable value for both sensitivity and specificity in a screening test is not less than 80% (Butler, 1988). In the present test, the optimal level of sensitivity was 93.3%, when the difficulty was in two areas of the test or more. This value was extremely high. It means that 93.3% of the children with difficulty in two areas or more areas were identified as having difficulties in reading. It means the test could not identify 6.7 % of the false negative cases. The specificity in the same areas of the test was only 66.6%, which was below the acceptable standard. It means 66.6 % of the children were identified with no problems in reading. In this case the false positive cases are 33.4%. It shows that the false negative cases were few and this increases the test validity. Because the value of specificity was below80%, the test is more useful as a diagnostic test than a screening test.

Table 4-12 Predictive validity and factors for future persistence learning problems in writing and numeracy test(n=98)

	# of cases no progress /	# of cases progress
Difficulties in any one or more areas	26	44
No Difficulties on the test	0	28
Sensitivity = /16 = 100%		
Specificity = 27/71 = 38%		
Difficulties in any two or more areas	14	30
No difficulties or difficulties in one area only	2	59
Sensitivity = 14/16 = 87.5 %		
Specificity = 59/89 = 66.3 %		
Difficulties in any three or more areas	6	24
No difficulties or difficulties in less than three areas of the test	8	61
Sensitivity = 6/14 = 42.9 %		
Specificity = 61/ 85 = 71.8 %		
Difficulties on all four areas	4	7
No difficulties or difficulties in three or fewer areas	12	75
Sensitivity = 4 / 16 = 25%		
Specificity = 75 / 82 = 91.5 %		

The results in Table 4-12 show similar results for the difficulties in both writing and numeracy. In the present test, the optimal level of sensitivity was 87.5% when the difficulty was in two areas of the test or more. This value was above the acceptable value in a screening test. It means 87.5% of the children with difficulties in two areas or more, were identified as having problems in either writing or numeracy. The false negative cases were 12.5 %. The specificity in the same areas of the test was only 66.3%. It is below the acceptable standard. It means that only 66.3 % of the children were identified with no problems in writing or numeracy. The false positive cases were 33.7%. If we compare it with the reading results, the test is better in identifying more false negative cases in reading than either in writing and numeracy.

Figure 4-1 Predictive validity: Difficulties in reading at 12 months follow up

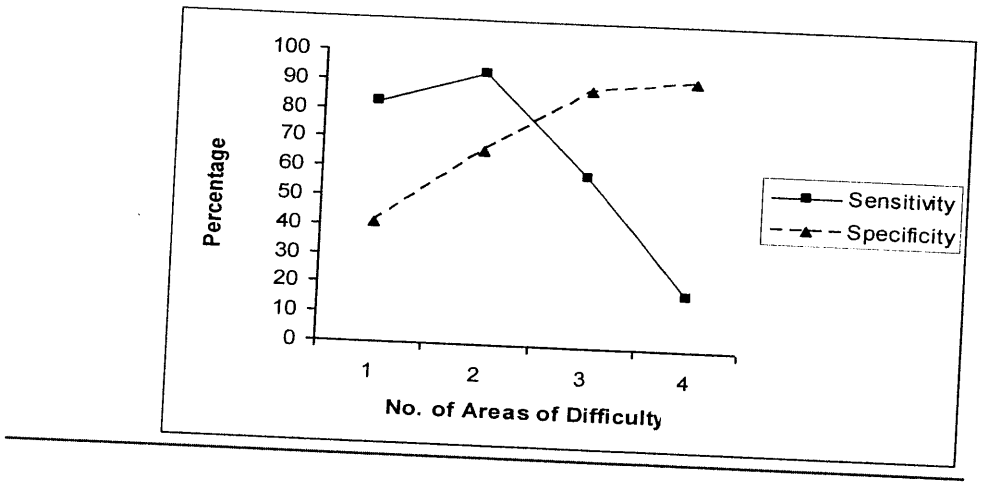
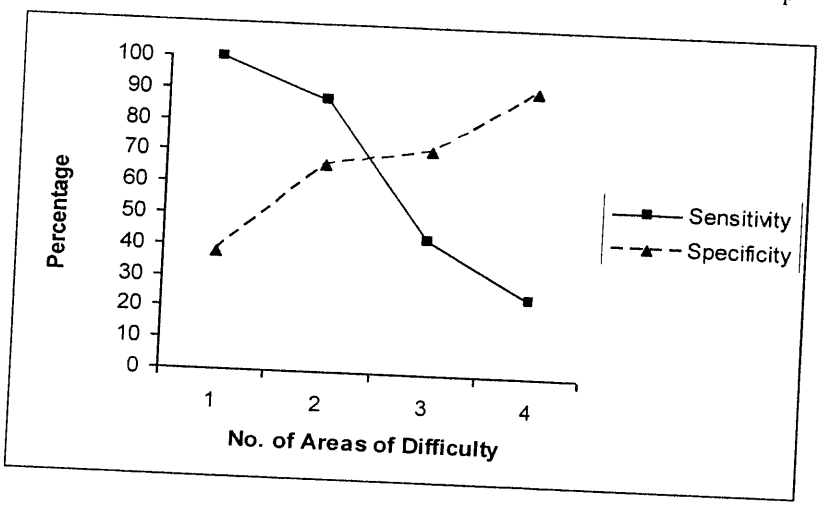


Figure 4-2 Predictive validity: Difficulties in writing and numeracy at 12 month follow- up



The two Figures 4-1 and 4-2, show that the number of grade 1 children with learning problems who were identified as having difficulties in reading, were more than the number of children who were identified as having difficulties in either writing or numeracy.

4.3.1.2 Concurrent validity

Concurrent validity is a correlation between scores from two related tests (Rust & Golombok, 1989; Hogen, 2007). I determined concurrent validity by using the test scores of all the children who participated in this research (group 1 and group 2) and the teacher's evaluation of the children's performances. I used point biserial correlation for phonological awareness tests, because the scores were interval and the teacher judgment was dichotomous. Table 4-13 shows the relationship between the

class teacher's evaluation of the children's performances in the class and the children's scores on the test.

Table 4-13 Point biserial correlations between the children scores on the test and teacher evaluation of the children's attainment(n=145)

No	Item	1	2	3
1	Initial sound(phoneme) in a word			
2	The shared sound (phoneme)in the beginning of two words	0.81**	-----	
3	The shared sound at the end of two words	0.83**	0.90**	------

* Correlation is significant at .05 level (2 tailed)
** Correlation is significant at .01 level (2 tailed)

The results in Table 4-13 show the correlation value for all items is in excess of r = 0.81. This means there is a high agreement between the class teacher's evaluations of the children academically and the children's scores on the test. The results indicate a high level of concurrent validity. It is concluded that the test achieved satisfactory levels of validity.

4.3.2 Construct validity

I used construct validity to examine if the test measures children's problems in reading, writing and numeracy (Salvia & Ysseldyke, 2006). I used point biserial correlation to find out if the test discriminates between the two groups' performances on the three tasks of phonological awareness. To determine the strength of the items, I used effect size. I used chi square tests to explore the extent to which the test discriminates children with learning problems from typically developed children. The chi square tests were more appropriate for concepts of print, writing, and numeracy items; because the scores were nominal, and ordinal. I used the standardized mean difference effect size (ESsm) to test the difference between the two groups. Binomial effect size display (BESD) was employed to convert correlation effect size into equivalent difference in success rate, which is an indicator of comparing two groups. Table 4-14 shows that the mean scores of the typically developed children (group 2) on the three items of phonological awareness were higher that the means scores of the children with learning problems (group 1). The t-tests show significant differences between the typically developed children and the children with learning

problems on the three items of phonological awareness. It means that the scores of the three items of phonological awareness identified the children with learning problems.

Table 4-14 Comparison between the children with learning problems group (1) and typically developed children group (2) on phonological awareness variables (n=145)

No	Item	Group	No	Mean score	Std.	t
1	Initial sound (phoneme)in a word	with problems	95	6.01	3.94	(141.20)= -21.48**
		Typ. developed	50	16.30	1.82	
2	The shared sound (phoneme) in the beginning of two words	with problems	95	0.69	1.06	(141.97) = - 29 0.0**
		Typ. developed	50	4.72	0.61	
3	The shared sound at the end of two words	with problems	95	0.44	0.92	(143) = - 4.12**
		Typ. developed	50	4.56	0.70	

* Correlation is significant at .05 level (2 tailed)
** Correlation is significant at .01 level (2 tailed)

Effect size is a measure of the strength of the relationship between two variables (Howitt & Cramer, 1997). I determined the effect size for each item in order to find the strength of each item in discriminating between the children in the two groups in reading. I used the differences between the means score of each group and the standard deviation to calculate the effect size. The calculated effect sizes for the three items are as follows:

Table 4-15 The strength of the effect size for phonological awareness items

Item	Effect size(d)	Confidence interval
1	3.04	2.55 - 3.53
2	4.29	3.69 - 4.90
3	4.81	4.16 - 5.46

In Table 3-15 the effect size shows that identifying the initial phoneme in a word is poorer at discriminating between the two groups than identifying the shared sound (phoneme) in the beginning of two words, and identifying the shared sound at the end of two words. The last two items are equally discriminating.

The data for concepts of print were nominal (yes/no), so chi square tests were an appropriate choice to investigate the differences between groups (1) and (2) on concepts of print. The results in Table 4-16 show that group (2), the typically developed children, performed better than group (1) children with learning problems

on the four items of concepts of print. This means the scores on the four items of the concepts of print can detect reading problems in young children.

Table 4-16 Comparison between children with learning problems (group 1) and typically developed children (group 2) on concepts of print n=145)

Item	Front of the book	Back of the book	identify letters	Identify words
X^2	37.81**	66.30**	27.72**	39.61**
ESsm	1.19	1.85	0.98	1.23
BESD	0.51	0.68	0.45	0.51

* Correlation is significant at .05 level (2 tailed)
** Correlation is significant at .01 level (2 tailed)

To determine which item was stronger in discriminating between the children with learning problems (group 1) and typically developed children (group 2), I used the standardized mean difference effect size (ESsm). ESsm is used to test the difference between the two groups using chi square value. Binomial effect size display (BESD) was employed to convert correlation effect size (ESsm) into equivalent difference in success rate, which is an indicator of comparing two groups. The threshold distribution of the score of the independent scores was at the middle. Group (1) was the control group, and group (2) was the treatment group. I started with finding the proportion of the scores for each group that is above the threshold (50%). Then I compared the two groups to determine the Binomial effect size display (BESD) as success rate.

In Table 4-16, I used the calculated standardized mean difference effect size (ESsm) to look for Binomial effect size display (BESD) success rate (Lipsey & Wilson, 2001, p. 153). The results indicate that 75 % of group (2) identified the front part of the storybook versus only 24 % of the grade 1 in group (1). In identifying the back part of the storybook, the success rate was 84 % of the grade 1 in group (2) versus only 15% of the grade 1 in group (1). In identifying letters in the storybook, the success rate was 72% for grade 1 in group (2) versus only 27% for grade 1 in group (1). The success rates for the two groups in identifying some words were the same as identifying the front of the storybook. Based on the results, the scores on identifying the back part of the storybook was the most discriminating item of concepts of print. The scores on identifying the back of the storybook can be used to discriminate

children with difficulties in reading from children with no difficulties in reading (Lipsey & Wilson, 2001). It can be concluded that the test achieved acceptable levels of validity.

The data for writing tests were ordinal so chi square tests were used to explore the differences between children with learning problems (groups 1) and typically developed children (group 2) on writing items. The results in Table 4-17 show statistically significant differences between the two groups on the four items of writing in the test. The typically developed children's (group 2) achievements were better than that of the children with learning problems (group 1) on the four items of writing. There is a probability of 1 in 100 or more that the deviation between the observed and expected frequencies is due to chance only. Deducing from the results, the four items of writing which were used in the test, could detect reading problems in young children.

Table 4-17 Comparison between children with learning problems (group 1) and typically developed children (group 2) on writing items(n=145)

Item	writing own name	Drawing human figure	writing a letter	copying shapes (n =144
X^2	10.26**	25.21**	48.17**	67.26**
ESsm	+0.55	+ 0.92	+1.42	+1.87
BESD	0.29	0.51	0.58	0.68

* Correlation is significant at .05 level (2 tailed)
** Correlation is significant at .01 level (2 tailed)

Standardized mean difference effect size (ESsm) and Binomial effect size display (BESD) were used to determine the strength of the items. The results show that 84% of the typically developed children (group 2) copied oblique shapes correctly versus 15% of the children with learning problems (group 1). The scores of copying oblique shapes discriminated more than the other items between the children who can write and who cannot write. The scores of copying oblique shapes can be used to discriminate the attainment of children with writing problems from children with no problems (Lipsey & Wilson, 2001). In conclusion, the test achieved satisfactory levels of validity.

Chi square tests were used for the numeracy analysis, because the data were ordinal. The results in Table 4-18 show a statistically significant difference between the

typically developed children (group 2) and the children with learning problems (group 1), on the strategy the children applied on the additive tasks.

Table 4-18Comparison between children with learning problems (group 1) and typically developed children (group 2) on numeracy (n=145)

Item	Numeracy strategy
X^2	108.69**
ESsm	3.51
BESD	0.83

* Correlation is significant at .05 level (2 tailed)
** Correlation is significant at .01 level (2 tailed)

Standardized mean difference effect size (ESsm) indicates that group (2) performed better on the additive tasks than group (1). The success rate on numeracy was above 91% for group (2) versus only 8% for group (1). Skipping an item identified the children with problems in numeracy. It means the test achieved acceptable levels of validity.

4.4 Performance of children with learning problems

This consists of three sections. In the first section I investigated whether the children with learning problems, who had difficulties with reading tasks, also had difficulties on both writing and numeracy tasks. In the second section I explore which subtasks or subtests predict the children with learning problems achievement in the future. In the third section I try to find the most appropriate timing for assessing learning problems in young Bahraini children.

4.4.1 Performance of children with learning problems in reading, writing and numeracy tasks

The aim of this section is to explore if the children who had difficulties in reading tasks had also difficulties on writing and numeracy tasks. I used probability to find the percentage of children who had problems in reading and also in writing and numeracy.

Table 4-19 The number of children with learning problems on reading, writing and numeracy tasks (groups 1 and 2, n=145)

	# of children Problems in reading	# of children No problems in reading	Subtotal
Problems in writing	49	7	56
Problems in numeracy	75	13	88
Problems in both writing and numeracy	48	5	53
No problems in writing and numeracy	6	47	53
Total	178	72	250

The result in Table 4-19 shows that 48 of the children with learning problems who did not do well on reading tasks did not do well on both writing and numeracy tasks too. This number represents 51.1% of the group 1 children with learning problems. It indicates an association between the three tasks. It might interpret that reading is important for both writing and numeracy too.

4.4.2 Prediction of the children with learning problems achievement in the school

The objective of this part is to explore which subtests or subtasks of the test predict future learning problems in reading, writing and maths. In this research, the sample size of the children with learning problems is small (N=95). Therefore, I used point biserial correlation instead of factor analysis. The children's scores on the test were either nominal ordinal, except the phonological awareness scores which were interval. The school outcomes were dichotomous (yes/no).

Table 4-20 shows the relationship between the achievement of the total sample of children with learning problems on phonological awareness items and concepts of print (subtests) and reading competencies in the school at the end of the year(school outcomes).

Table 4-20 Point biserial correlations between the scores of phonological awareness and concepts of print items for the whole group of the children with learning problems and the group achievement on reading competencies in the school at the end of the year (group 1, n=95)

No	Item	1	2	3	4	5	6	7	8
1	Initial sound (phoneme) in a word								
2	Shared sound in the beginning of two words	0.25*	___						
3	Shared sound at the end of two words	0.29*	0.40**	___					
4	Identifying the front part of the book	0.16	0.17	0.27*	___				
5	Identifying the back part of the book	0.07	0.12	0.29*	0.80**	___			
6	Identifying some letters in the book	0.18	0.27**	0.22*	0.13	0.11	___		
7	Identifying some words in the book	0.05	0.15	0.13	0.17	0.20	0.46**	___	
8	Reading competencies (school outcomes)	0.36**	0.18	0.28*	0.16	0.08	0.25*	0.19	_

* Correlation is significant at .05 level (2 tailed)
** Correlation is significant at .01 level (2 tailed)

The results in Table 4-20 show that high scores on the subtest of identifying the initial sound (phoneme) in a word is the most predictive for future success in reading for children with learning problems only (group 1). It means that children with learning problems who scored high on the task of identifying the initial sound in a word achieved well in reading competencies at the end of the year. The subtest on identifying the initial sound in a word is the best predictor for future reading for the group of children with learning problems.

Table 4-21 and 4-22 show the predictive subtests in reading for the preschool children and grade 1 children separately.

Table 4-21 Point biserial correlations between the scores of phonological awareness and concepts of print items for the preschool children with learning problems and their achievement on reading competencies in the school at the end of the year (group 1, n=47)

No	Item	1	2	3	4	5	6	7	8
1	Initial sound (phoneme) in a word								
2	Shared sound in the beginning of two words	0.15							
3	Shared sound at the end of two words	-0.003	0.53**						
4	Identifying the front part of the book	-0.10	-0.06	-0.06					
5	Identifying the back part of the book	-0.10	-0.06	-0.06	1.00**				
6	Identifying some letters in the book	0.15	0.08	0.12	0.14	0.14			
7	Identifying some words in the book	-0.10	-0.08	-0.05	-0.12	-0.12	0.23		
8	Reading competencies(school outcomes)	0.42**	0.18	0.32*	-0.18	-018	0.32*	0.04	

* Correlation is significant at .05 level (2 tailed)
** Correlation is significant at .01 level (2 tailed)

The results in Table 4-21 show that the subtest on identifying the initial sound in a word is the best predictor for future achievement in reading for preschool children with learning problems.

Table 4-22 Point biserial correlations between the scores of grade 1 children with learning problems on phonological awareness and concepts of print items and their achievement on reading competencies in the school at the end of the year (group 1, n=48)

No	Item	1	2	3	4	5	6	7	8
1	Initial sound (phoneme) in a word								
2	Shared sound in the beginning of two words	0.07							
3	Shared sound at the end of two words	0.33*	0.29*						
4	Identifying the front part of the book	0.04	0.007	0.22					
5	Identifying the back part of the book	-0.09	-0.04	0.25	0.74				
6	Identifying some letters in the book	0.12	0.31*	0.23	0.07	0.03			
7	Identifying some words in the book	0.07	0.16	0.15	0.19	0.26	0.66**		
8	Reading competencies (school outcomes)	0.30*	0.19	0.28	0.29	0.14	0.15	0.32*	

* Correlation is significant at .05 level (2 tailed)
** Correlation is significant at .01 level (2 tailed)

The results in Table 4-22 show that the scores of the children on the subtest of identifying some words in the storybook were the best predictors for future achievement in reading for grade 1 children with learning problems. However, these results required caution because the sample size was small.

To determine the most predictive subtest in writing, I ran also point biserial correlation between the children scores in writing one's own name, drawing a human figure, writing a letter to their favourite person, coping shapes, and the children achievement on writing competencies in the school at the end of the year.

Table 4-23 Point biserial correlations between the scores of the group of children learning problems on writing items and their achievement on writing competencies in the school at the end of the year(n=95)

No	Item	1	2	3	4	5
1	Drawing of human figure					
2	Writing own name	0.36**				
3	Child's letter	0.37**	0.35**			
4	Copying Shapes	0.39**	0.19	0.2		
5	Writing competencies (school outcomes)	0.08	0.42**	0.25*	0.20	

* Correlation is significant at .05 level (2 tailed)
** Correlation is significant at .01 level (2 tailed)

The results in Table 4-23 show that the children's high scores on writing one's own name predict future writing for the group. The subtest on writing one's name is the best predictor for future writing achievement for the group of children with learning problems.

I used point biserial correlation to investigate whether the preschool children with learning problems share the same predictor for future achievement in writing with grade 1 children with learning problems.

Table 4-24 Point biserial correlations between the scores of the preschool children with learning problems on writing items and their achievement on writing competencies in the school at the end of the year (n=47)

No	Item	1	2	3	4	5
1	Drawing of human figure					
2	Writing own name	0.64**				
3	Child's letter	0.20	0.28			
4	Copying Shapes	0.37*	0.20	0.13		
5	Writing competencies (school outcomes)	0.33*	0.49**	0.25	0.30*	

* Correlation is significant at .05 level (2 tailed)
** Correlation is significant at .01 level (2 tailed)

The results on Table 4-24 show that the subtest on writing one's name is the best predictor for preschool future attainment in writing.

Table 4-25 Point biserial correlations between the scores of grade 1 children with learning problems on writing items and their achievement on writing competencies in the school at the end of the year (n=48)

No	Item	1	2	3	4	5
1	Drawing of human figure					
2	Writing own name	0.28				
3	Child's letter	0.29*	0.35*			
4	Copying Shapes	0.38**	0.23	0.32*		
5	Writing competencies (school outcomes)	0.09	0.32*	0.35*	0.12	

* Correlation is significant at .05 level (2 tailed)
** Correlation is significant at .01 level (2 tailed)

The results on Table 4-25 show that the grade 1 children high scores on writing a letter to a favourite person predict achievement on writing. This subtest predicts grade 1 future attainment in writing.

In numeracy, I used only the additive tasks to identify the children's problems in counting. I used point biserial correlation to find out if these tasks predict the children's achievements in maths. I used the children's counting strategies on the tasks and their achievements in maths competencies at the end of the year.

Table 4-26 Point biserial correlations between the numeracy strategy the children with learning problems used in counting and their achievement in maths competencies in the school at the end of the year of grade 1 children with learning (n=95)

No	Item	1	2
1	Numeracy		
2	Maths competencies (school outcomes)	0.26*	

* Correlation is significant at .05 level (2 tailed)
** Correlation is significant at .01 level (2 tailed

The results in Table 4-26 show that the additive tasks (numeracy) predict the children's future performance in maths at school. I used the same correlation to find out if these tasks predict the subgroup attainment.

Table 4-27 Point biserial correlations between the numeracy strategy the preschool children with learning problems used in counting and their achievement in maths competencies in the school at the end of the year (n=47)

No	Item	1	2
1	Numeracy		
2	Maths competencies i(school outcomes)	0.40**	

* Correlation is significant at .05 level (2 tailed)
** Correlation is significant at .01 level (2 tailed

The results in Table 4-27 show that the additive tasks in numeracy predict the preschool children's future attainment in maths.

Table 4-28 Point biserial correlations between the numeracy strategy grade 1 children with learning problems used in counting and their achievement in maths competencies in the school at at the end of the year (n=48)

No	Item	1	2
1	Numeracy		
2	Maths competencies (school outcomes)	0.16	

* Correlation is significant at .05 level (2 tailed)
** Correlation is significant at .01 level (2 tailed

The results in Table 4-28 show that the additive tasks in numeracy do not predict grade 1 children's future achievement in maths.

4.4.3 Appropriate time for assessing the children for learning problems

In assessing young children, it is very important it takes place at an appropriate time in order to gain benefit. The aim of this section is to explore whether it is more appropriate to administer the test at the end of the preschool level or at the end of grade 1. The test which I used in this research is a developmental test. Therefore, I explore children with learning problems achievement on the test in relation to age and education level. I used Pearson and Spearman correlation tests to explore the relationship between the children's achievement on the test and their age at observation. I used item analysis and t test to compare the reliability and validity of the test for the preschool children and grade 1 children with learning problems.

4.4.3.1 Age and children's achievement

I used Pearson's correlation test to find the relationship between the children scores on phonological awareness items and the children's age at observation. Pearson's correlation is appropriate because I had interval data.

Table 4-29Pearson's correlation correlations between the children with learning scores on phonological awareness and their age at observation (group 1, n=95)

No	Item	1	2	3	4
1	Initial sound (phoneme) in a word				
2	Shared sound (phoneme) in the beginning of two words	0.25*			
3	Shared sound at the end of two words	0.30**	0.40**		
4	Age at observation	0.31**	0.34**	0.25*	

* Correlation is significant at .05 level (2 tailed)
** Correlation is significant at .01 level (2 tailed)

The data in Table 4-29 are for the children with learning problems (group 1). The highest significant correlation is between identifying the shared phoneme in the beginning of two words and the age at observation. The results show that older children with learning problems can identify the phoneme in the beginning of single word, and the shared phoneme in the beginning or at the end of two words better than younger children. Looking at children's scores, 32.63% children identified the initial phoneme in a word, 61.29% were older children and 38.7% were younger children. 94.74% of the older children reached competency in reading, writing and maths. 84.2% were in grade 1 and 10.53% in preschool. The higher number of older children who can identify the phoneme in the beginning of a word and reached competency in reading, writing and maths were in grade 1. It means there is an association between the scores of the children in phonological awareness and the age of the children at observation.

Table 4-30 Spearman correlations between the scores of children with learning scores on writing items and their age at observation (group 1, n=95)

No	Item	1	2	3	4	5
1	Drawing of human figure					
2	Writing own name	0.36**				
3	Child's letter	0.37**	0.35**			
4	Copying Shapes	0.39**	0.2	0.2		
5	Age at observation	0.24*	0.36**	0.46**	0.12	

* Correlation is significant at .05 level (2 tailed)
** Correlation is significant at .01 level (2 tailed)

I used Spearman's correlation tests for writing because I had an ordinal data. The highest significant correlation in table 4-30 is between writing a personal letter and the age at observation. Looking at the children's scores on writing a letter, 60.97% of the children who wrote a letter were older children. 8% of them were in preschool and they reached competency in reading, writing and maths. The remaining 92% were in grade 1, 68% of them reached competency in the three subjects. It shows the number of older children who wrote a letter and reached competency was larger than the number of the younger children. Most of the older children were in grade 1. This means there is an association between the scores of the children on writing and their age at observation.

Another important observation in the table is the weak correlation between the scores of copying shapes and the age at observation. It means that the score of child on copying the diamond shape is not associated with the age of the child.

Table 4-31Spearman correlations between numeracy strategy the children with learning problems used in counting and their age at observation (group 1, n=95)

No	Item	1	2
1	Numeracy		
2	Age at observation	0.31	

* Correlation is significant at .05 level (2 tailed)
** Correlation is significant at .01 level (2 tailed

I used Spearman's correlation test because the numeracy data were ordinal. The results in Table 4-31 show no significant correlation between the scores on counting and age at observation. The number of children who could count was 31.57% only. These were younger children. All of these children reached competency in reading,

writing and maths. The results show the test is a developmental test which means the test is valid. In addition the results show it is better to assess the children at the end of grade 1 than at the end of the preschool level. At the end of grade 1 the children are more developed than the children who just enter grade 1.

4.4.3.2 Comparison between grade 1 and preschool in group (1)

The highest test reliability for the preschool children was below the satisfactory standard (0.55) when items in Table 4.32 were included. In terms of the quality, 5 items were of good quality. Items 4 and 5 were problematic because of the minus sign. When items 2, 3, 4, 5 and 7 were removed, the test reliability reached 0.64. See Table 4-32.

Table 4-32Item analysis for the items in the test for the preschool with learning problems (group 1, n=47)

No	Item	Scale mean if item deleted	Scale variance if item deleted	If corrected item-Total correlation	Cronbach's Alpha if item deleted
1	Identify the initial phoneme a word	2.83	2.54	0.26	0.51
2	Identify the shared phoneme in the beginning of 2 words	3.26	3.19	0.00	0.55
3	Identifying the shared sound at The end of 2 words	3.26	3.19	0.10	0.55
4	Identifying the front part of the storybook	3.23	3.22	-0.10	0.56
5	Identifying the back part of the story book	3.23	3.22	-0.10	0.56
6	Identifying some letters in the storybook	2.74	2.28	0.43	0.45
7	Identifying some words in the story book	2.87	2.85	0.06	0.58
8	The child's strategy in arithmetic task	3.21	2.99	0.22	0.53
9	Human drawing of a favourite person	2.60	2.37	0.40	0.47
10	Copying Shapes	3.17	2.88	0.24	0.52
11	Writing own name	2.55	2.34	0.45	0.45
12	Writing a letter	2.85	2.34	0.33	0.49

The highest test reliability for grade 1 with learning problems (group 1) was a satisfactory (0.69) when the items in Table 4-33 were included. All the items were of good quality except four items (items 2, 8, 9 and 10). Removal of these items did not change the internal consistency of the test. It indicates that these items were not problematic. The test for grade 1 had better interval consistency reliability than the preschool test.

Table 4-33 Item analysis for the items in the test for grade 1 children with learning problems (group 1, n=48)

No	Item	Scale mean if item deleted	Scale variance if item deleted	If corrected item-Total correlation	Cronbach's Alpha if item deleted
1	Identify the initial Phoneme in a word	5.04	4.08	0.36	0.64
2	Identify the shared phoneme in the beginning of 2 words	5.75	4.36	0.16	0.67
3	Identifying the shared sound at the end of 2 words	5.79	4.21	0.34	0.65
4	Identifying the front part of the storybook	5.60	3.82	0.39	0.63
5	Identifying the back part of the story book	5.63	3.86	0.38	0.63
6	Identifying some letters in the storybook	5.23	3.67	0.46	0.62
7	Identifying some words in the story book	5.35	3.55	0.49	0.61
8	The child's strategy in arithmetic task	5.73	4.29	0.20	0.67
9	Human drawing of a favourite person	5.04	4.47	0.09	0.68
10	Copying shapes	5.71	4.30	0.17	0.67
11	Writing own name	5.04	4.17	0.45	0.45
12	Writing a letter	4.94	4.40	0.35	0.65

The phonological awareness items in Table 4-34 were from the preschool children with learning problems (group 1).

Table 4-34 Item analysis for the 3 tasks of phonological awareness for the preschool children with learning problems (group 1, n=95)

No	Sound	Scale mean if item deleted	Scale variance if item deleted	If corrected item-total correlation	Cronbach Alpha if item deleted	Item diff
2	b (بُـ)	3.80	12.07	0.6	0.85	0.09
3	No equivalent(عُـ)	3.85	13.30	-.02	0.87	0.04
4	baa(با)	3.79	12.04	0.54	0.85	0.02
5	th`` (طا)	3.87	13.20	0.09	0.86	0.49
6	(عَـ)	3.41	11.07	0.59	0.85	0.49
7	tho (ثُـو)	3.41	11.16	0.56	0.85	0.11
8	f (فِـي)	3.57	11.40	0.52	0.85	0.32
9	q (قَـ)	3.67	12.31	0.38	0.86	0.13
10	sh (شَـ)	3.43	11.03	0.61	0.85	0.47
11	h``((حـ)	3.76	12.05	0.50	0.85	0.13
12	m (مـ) or f (فُـو)	3.72	11.55	0.63	0.85	0.17
13	k (كـ)	3.74	12.06	0.45	0.85	0.15
14	w(وَ)	3.43	11.03	0.61	0.85	0.47
15	t(تَـ)	3.83	12.23	0.59	0.85	0.06
16	thee (ـذي)	3.68	11.35	0.64	0.84	0.21
17	s`(صَـ)	3.43	11.42	0.48	0.85	0.47
22	shaa (شا)	3.81	12.94	0.15	0.86	0.09

The highest level of test reliability was 0.86 when only 17 items from the 3 tasks of phonological awareness were included as in Table 4-34. All the items in the table were from task 1 except the last one which is from task 3. Task 1 was on identifying the initial phoneme or sound in the word; whereas task 3 was on identifying the

shared sound at the end of two words. It seems that both task 2 which was on identifying the shared sound in the beginning of two words and task 3 were very difficult for the children. The third column in the table presented the point biserial correlation values for the preschool children. Item 3 is problematic because of its negative sign and low value of item difficulty. Removal of item 3 increased the internal consistency of the test to 0.87.

Table 4-35 Item analysis for the 3 tasks of phonological awareness for grade 1 children with learning problems(group 1, n=48)

No	Sound	Scale mean if item deleted	Scale variance if item deleted	If corrected item-total correlation	Cronbach Alpha if Item deleted	Item diff.
2	b(بُـ)	6.76	16.28	0.46	0.82	0.28
3	No quivalent (عُـ)	6.89	17.01	0.33	0.82	0.11
4	b(بـا)	6.82	16.47	0.45	0.82	0.21
5	th`` (طـا)	6.33	16.96	0.27	0.83	0.68
6	(عـَ)	6.22	17.18	0.27	0.83	0.78
9	q (قـِ)	6.64	16.28	0.45	0.82	0.66
10	sh (شـَ)	6.36	16.28	0.45	0.82	0.66
11	h(`حـِ)or f (فـُو)	6.69	16.85	0.31	0.83	0.34
12	m (مـِ)	6.71	15.89	0.54	0.81	0.32
13	Sound k(كـِ)	6.64	15.51	0.62	0.81	0.38
14	w (وَ)	6.38	16.64	0.34	0.82	0.64
15	t (تَـ)	6.78	17.04	0.25	0.83	0.26
17	s`(صـَ)	6.84	17.41	0.18	0.83	0.19
21	Ba(بـَ)	6.73	16.79	0.31	0.83	0.30
22	sh (شـَ)	6.80	16.48	0.43	0.82	0.23
23	Mu (مُـ)	6.91	16.91	0.41	0.82	0.13
31	Ra (رـ)	6.96	17.04	0.44	0.82	0.09
32	Na (نـ)	6.96	17.04	0.44	0.82	0.09
33	Za(زـ)	6.93	16.70	0.53	0.82	0.11
34	Ka(قـ)	6.78	16.13	0.52	0.82	0.26
35	s`(صـَ)	6.76	16.83	0.30	0.83	0.24

The highest test reliability on phonological awareness tasks for grade 1 with learning problems was 0.84 when 21 items were included. 8 problematic items were removed from the data. In Table 4-35 the first 13 items were from task 1 in the phonological awareness test. The next three items 21, 22 and 23 were from task 2. The last five items were from task 3. One could observe that all items were of good quality. The items fit together properly. There were some difficult items, 31 and 32, but these items had good quality. In conclusion, the grade 1 test was better than that of the preschool.

Table 4-36 Comparison between the preschool children and grade 1 children with learning problems (group 1) on phonological awareness variables(group 1, n=95)

No	Item	Group	No	Mean score	Std. Deviation	t
1.	Initial phoneme or name of a letter in a word	Preschool	47	9.66	6.01	(87) = 0.07**
		Grade 1	48	9.58	4.50	
2.	Initial sound in a word	Preschool	47	4.53	3.75	(93) = - 4.08**
		Grade 1	48	7.08	3.91	
3.	The shared sound in the beginning of two words	Preschool	47	0.21	0.51	(62.5) = - 4.88**
		Grade 1	48	1.17	1.25	
4.	The shared sound at the end of two words	Preschool	47	0.19	0.50	(64.09) = - 2.71**
		Grade 1	48	0.69	1.15	

Adjusting (df) following a significant Levine test significant.

The results in Table 4-36 show that grade 1 children with learning problems (group 1) achieved better than the preschool children in the same group on the three tasks of phonological awareness (reading), when only the sound of the letter was accepted as a correct answer. The effect size for the items 2, 3, and 4 are as follows:

Table 4-37 The effect size for the phonological awareness tasks administered to the children with learning problems (group1)

No	Item	Effect size(d)	Confidence interval
1	Identifying the initial phoneme(sound) in a word	0.66	0.25 - 1.07
2	Identifying the shared sound in the beginning of two words	0.99	0.57 - 1.42
3	Identifying the shared sound at the end of two words	0.56	0.15 - 0.97

The results in Table 4-37 show that identifying the initial sound or phoneme in a word does not differ from identifying the shared sound in the beginning of two words and identifying the shared sound at the end of two words. There is no difference in the three items abilities to discriminate between preschool children and grade 1 children in-group (1) which is children with learning problems. Identifying the shared sound at the end of two words is as strong as identifying the shared sound in the beginning of two words.

Figure 4-3 A comparison between the mean scores of the preschool children and grade 1 children (Group 1) on the three items of phonological awareness (n=95)

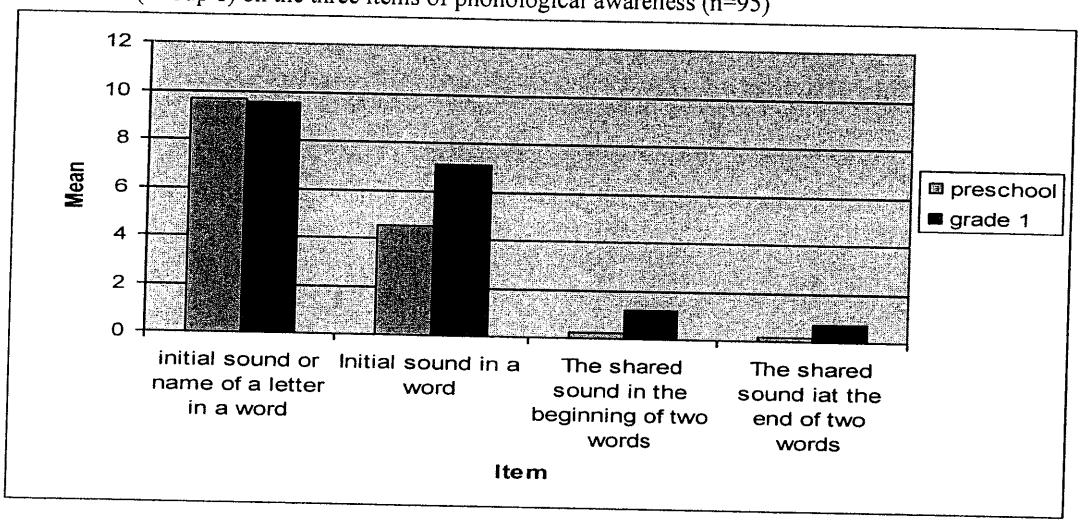


Figure 4-3 shows clearly the sound of the letter can be used to discriminate between grade1 and the preschool in group (1) which is the children with learning problems. The test of grade 1 children with learning problems had higher reliability and item quality than that of the preschool children with learning problems. The results of grade 1 children on phonological awareness show that the children performed better than the preschool children.

In summary most of the older children are from grade 1 and they did better on the test than the younger children who come from the preschool. The reliability of the grade 1 test was higher than the preschool test. The grade 1 children's achievements on the test were better than the preschool children. It is more useful to diagnose the children's learning problems at the end of grade 1 than at the end of preschool.

4.5 Summary

In this chapter, I described the procedures I followed to determine the reliability, and the validity of the screening test. The tests had the highest reliability when the sound of the letter only was accepted as a correct answer, and the three items from concepts of print were removed. I ran analysis using point-biserial correlation, and I found that the items in the test were more internally consistent when these three items were removed. Copying shapes and identifying the shared sound in the beginning of two words had the lowest values. On the other case, when either the sound or the name of a letter was considered as a correct answer, identifying the initial sound or name of the letter in a word had the lowest value. This indicated that children who performed well on these items did very poorly on other items and verse versa. This result shows that phonological awareness is more important than the knowledge of letters in Arabic

Item difficulty analysis showed that the children with learning problems struggled with the test items, but the comparison between the performances of the children with learning problems, and typically developed children using t-tests revealed that the typically developed children performed very well on the test. Deducing from that, the children who performed poorly were possibly weak at the time of the test, and also it is not necessary that the items in the test were difficult.

The test was valid. The correlation showed high agreement between the teacher's evaluations of the children's performance in the class and the children's scores on the test. On the additive risk model, the children who experienced problems in two areas of the test and more might be at risk of failure in reading, writing and numeracy. It seems that the concepts of print and numeracy were the two areas that could influence the performances of children with learning problems. The high sensitivity and the low specificity of the test indicate that the developed test can be used as a diagnostic tool rather than a screening test. This will lead to a decline in false positive cases.

The results of the t tests showed that typically developed children performed better than children with learning problems. The scores of the children on identifying the shared sound in the beginning or at the end of two words were stronger than when identifying the initial phoneme in a word, in discriminating the children with learning problems (group 1) from the typically developed children (group 2). Similar results were found between the grade 1 children and preschool children in the group of children with learning problems (group 1).

The scores of the children on identifying the back of the book differentiate more between the typically developed children and children with learning problems on reading than other items. Copying oblique shapes, particularly the diamond shape, can be used to identify children with problems in writing. Skipping an item during counting discriminates between typically developed children and the children with learning problems on numeracy. In conclusion, the discrimination between the typically developed children and children with learning problems increased the validity of the test.

The subtests which were the most predictive for achievement for the group of the children with learning problems were identifying the initial sound in a word in reading, writing one's name in writing and the additive tasks in maths.

In relation to the timing of the test, grade 1 children performed better than the preschool children. The test of grade 1 children was more reliable than the test of the preschool children. Administration of the test at end of grade 1 year is more appropriate than that at the end of the preschool. I need to consider the coping strategies used by both the preschool children and grade 1 children with learning problems before I make final conclusion about the timing of the test.

5 Results (2)

5.1 Introduction

This chapter contains the qualitative analysis of the collected data in this research. The chapter consists of two parts. In the first part, I discuss the negative coping strategies which the children with problems (group 1) and the typically developed children (group 2) used during my interviews with them. In this section I propose a classification for the coping strategies. Later, I discuss five cases, which I enquire about one year later. On the second part, I discuss some children's performances on some tasks (both group 1 and group 2) on the test. At the end, I explore if there is a link between the children's achievements and their use of coping strategies.

5.2 Coping strategies

The definition of a coping strategy, which I used in this research, is the following: "A coping strategy is a child's effort to deal with the difficulty of an academic task. This effort might change in one situation to another. From the child's point of view, it is a solution for a problem, although the coping strategy does not provide a solution to the academic task. The child uses the coping strategy to control his/her emotions and protect his/her self-esteem. The coping strategy could be an action such as hiding a book, using oral language such as I want to go or non-readable written symbols (Lazarus, 1980). The coping strategies which the children used were positive from the point view of the children, but they were negative in the context which they were used in. They did not help the children to complete the academic tasks with accuracy".

5.2.1 Classification of the coping strategies

I classified the negative coping strategies, which the children with learning problems (group 1) and typically developed children used, into "on task" coping strategies and "avoidance" coping strategies. In the first part, I discuss the coping strategies which the children with learning problems used during the interviews. In the second part, I present the coping strategies which the typically developed children used.

5.2.1.1 Children with learning problems coping strategies

In this section I discuss the "on task" and "avoidance" coping strategies which the preschool and grade 1 children with learning problems (group 1) used during the interviews.

5.2.1.1.1 "On task" coping strategies

"On task" coping strategies were the negative strategies which the children used when they evaluated their external situation as harmful. They had appropriate personal resources so they selected to stay and work on the academic task (Lazarus, 1980). These coping strategies were negative in the context they were used in. They were not the same as the "task-focused" or "on task behaviour" or strategies used in other studies (Georgiou et al, 2010). The task-focused strategies are effective strategies and children are trained to use them in order to complete the academic tasks with success.

5.2.1.1.1.1 "On task" coping strategies used by preschool children only

The following are the three negative "on task" coping strategies which were used by the preschool children with learning problems:

1. Pretend to read in the story. An example is:

   Researcher: I placed in front of the child two storybooks.

   Researcher said: "I want you to pick up one book and open it"

   Preschool girl: She picked up one book.

   Researcher said: "I want you to read from the beginning of the story".

   Preschool girl: The girl moved her pointer on the lines.

   Preschool girl: She recited some verses from the Quran: "*Alhamdullah rabela alameen. Alrahman alraheem..*".

   Another girl saw a picture of a mother and a girl on the page in front of her.

   The girl: Moved her finger on the lines.

   The girl said: "*Umi tmashet shari*".

   A translation is: "My mother combs my hair".

The children who used these strategies were comfortable, and involved in the tasks. It means they got satisfaction which was the purpose of using the coping strategies.

2. Guessing and eye contact were used on phonological awareness tasks. An example of guessing and eye contact is the following

Researcher: I placed in front a child pictures of an eye, a cock and an ear.

Researcher: This is "ɑyɑn", "di ː k" and "ʊðən". Then

Researcher: "I want you to point at the two words which ends with the same sound".

The girl: First pointed at the picture of "ɑyɑn" (eye) and looked at me.

The girl: Pointed at the picture of "di ː k" (cock) and looked at me again.

The girl: Moved to the picture of "ʊðən" (ear) and looked at me.

The girl: Moved to the picture of "ɑyɑn" (eye) and looked at me.

The girl continued doing this until I moved to the next task.

3. Pretending to write is used on writing a letter to a favourite person. An example is :

Preschool girl: made scattered curved small scribbled all over the page.

Researcher: "what did you write?

The girl said: "تشتري لي أمي صورة وردية ".

The translation is: "My mother buys me a pink doll".

5.2.1.1.1.2 "On task" coping strategies used by grade 1 children only

The following are the two on task coping strategies which were used by grade 1 children with learning problems only:

1. The first one I called it "taught strategy". It is used in counting (additive tasks). An example is:

Researcher: I placed in front of a child a collection of 5 counters and a collection of 4 counters.

Researcher said: "These are 5 counters and I screened them and these are 4 counters and I screened them. How

many counters altogether?"

The child said: *"5 in my head and he hits his head. Then he counts on the other collection on his fingers by saying 5, 6 ,7, 8".*

This child did not get the correct answer. He just memorized the procedure only. He counted two counters as 5.

2. The other "on task" strategy was used in writing a letter. An example is:

The child: write with one hand and covered his writing by placing his other hand and head on the table to cover his writing.

5.2.1.1.1.3 "On task" strategies used by both the preschool and grade 1 children

The following are the "on task" coping strategies which were used by both the preschool and grade 1 children with learning problems:

1. Rhymes in counting. The preschool children used rhymes in counting more than the grade 1. An example is:

Researcher: I placed in front of a child 18 counters.
Researcher said: "I want you to count these counters".
The child: Placed his finger on the first counter.
The child said: *"Waaan"*
The child: Placed his finger on the next counter.
The child said: *" Two..o"*
The child: Moved his finger to the next counter
The child said: *"thre...e"*.
The child: Moved his finger on two counters very fast.
The child said: *"Fou...r"*.

Every time the child says the number word he makes it long. Sometimes the movement of the finger is faster than the saying of the number word and the child skips one or more counters. Most of the children who used this strategy were from the preschool. The results show that the preschool's children found the additive tasks

very difficult. It is possible that they were not familiar with the procedure, so they used the rhyme as a release.

2. Guessing and eye contact in counting. The preschool children used guessing and eye contact more than the grade 1 children. An example is:

Researcher:	I placed two screened collections of 4 and 5 counters in front of a child.
Researcher said:	*"How many altogether"?*
The child said:	*"6."*
The child:	He looked at me.
Researcher:	I waited.
The child said:	*"7".*
The child:	He looked at me
Researcher:	I waited
The child said:	*"8"*
The child:	He looked at me

3. Frequent erasing in drawing and writing
4. Small size drawing or letters in writing tasks.

The children used erasing and small drawing when they cannot draw some parts of the body, diamond shape and writing some letters. The "on task" coping strtaegies were appropriate to the academic tasks.

5.2.1.1.2 "Avoidance" coping strategies

The negative "avoidance" coping strategies were used, when the children evaluated their external situation as a very harmful one, and beyond their personal resources. If they find it hard to deal with it, they try to decrease their internal stress. In this situation the children prefer to stay away from the situation (Lazarus, 1980).

"*I do not know*" was the most popular coping strategy among both the preschool school children and the grade 1 children with learning problems. An example from the numeracy task is the following:

Researcher:	I placed two screened collections of 9 and 6 counters in front of the child.

Researcher said: "How many altogether"?

The child said: *"I do not know".*

Researcher: "Let's think about it". The researcher introduced the task again.

The child said: *"I do not know".*

Grade 1 children with learning problems used an indirect external support in their strategies to make their situation strong or to defend themselves. These are some examples:

1. An example is from the additive tasks in numeracy:

Researcher: I was trying to place two collections of counters 9 and 6 in front of a child

The child said: *"I want to go. The teacher wants me".*

2. An example from reading the story.

The child: Picked up one storybook and opened it

Researcher: "I want you to read the story from the beginning"

The child: The child smiled

The child said: *"I cannot read. I am just in grade 2"*

3. In writing one's own name

Researcher: I placed in front of a child a blank paper and a pencil.

Researcher: "Could you write your name on the paper?"

The child said: *"I cannot write my full name. I cannot write. They did not give me writing".*

5.2.1.1.3 The list of the coping strategies across different tasks in the test

The following are the two groups of negative coping strategies which the children with learning problems used in this research.

Table 5-1 Number of the preschool and grade 1 children with learning problems who used various types of negative "on task" coping strategies on different academic tasks (n=95)

Strategy	Area	# of Preschool Children	# Grade 1 Children	Total
Taught strategy	Additive Tasks	-	3	3
Rhyme	Additive tasks	15	2	17
Frequent erasing	Human figure	3	10	13
Frequent erasing	Letter	2	4	6
Frequent erasing	Diamond	2	4	6
Small drawing	Diamond	8	5	13
Small drawing	Human figure	2	2	4
Writing in one hand and covering the drawing with the other hand and head on the table	Letter	-	3	3
Guessing and or eye contact	Phonological awareness	15	-	15
Guessing and or eye contact	Additive tasks	5	2	7
Guessing and or eye contact	concepts of print	5	-	5
Pretend to write	Letter	14	-	14
Pretend to read(Quran)	Concepts	4	-	4
Pretend to read(memory)	Concepts	2	-	2
Pretend to read (picture)	Concepts	2	-	2
	Total	79	35	114

Table 5-1 shows examples of "on task" coping strategies and their frequencies in the group of children with learning problems, both preschool and grade 1. These coping strategies were negative and appropriate to the academic task. For instance, "the taught strategy" is used in maths as counting on strategy, but the children didnot used it correctly.

When we look at the strategies in Table 5-1, it shows that the highest number of coping strategies which grade 1 children with learning problems used was frequent erasing on human figure. It might indicate that these grade 1 children had a problem in transferring their internal model of the human to the paper. The grade 1 children with learning problems used more coping strategies that involved no talking. It

might indicate they had low self-esteem. Most of these coping strategies were relevant to the academic tasks the children were working on.

Table 5-2 Number of the preschool and grade 1 children with learning problems who used various types of negative "voidance" coping strategies in different academic tasks (n=95)

Strategy	Area	# Preschool	# Grade 1	Total
I do not know	Phonological awareness(reading)	-	1	1
I do not know	Reading(story)	-	2	2
I do not know	Writing(letter)	1	2	4
I do not know	Human figure	1	-	1
I do not know	Additive tasks	1	-	1
I want to go, or I want to go the teacher wants me	Additive tasks	1	-	1
I want to drink water	Phonological awareness (reading)	1	-	1
I want to go to class	Phonological awareness (reading)	-	1	1
I cannot read I am just in grade 2	reading(story)	-	1	1
My stomach is paining me	Additive tasks	1	0	1
I cannot write my full name. I cannot write. They did not give me writing	Writing name	-	1	1
Total		6	8	14

The results on Table 5-2 show that grade 1 children with learning problems used avoidance coping strategies more than the preschool children with learning problems. I used chi square test ($X^2 = 47.25^{**}$) and I found there is a significant difference between the two groups on using "avoidance" coping strategies.

In summary, the results in both Tables 5-1 and 5-2 show that the children with learning problems did not apply any coping strategy on identifying the initial sound in a word. It means the children found the task very easy. The children with learning problems used "on task" strategies more than "avoidance" coping strategies. Some children used both "on task" coping strategies and "avoidance" coping strategies on identifying the shared sound in the beginning and at the end of two words. The preschool children with learning problems used these coping strategies more than the

grade 1 children with learning problems. It indicates that both tasks were very difficult for the preschool children. It is possible they entered school with limited knowledge on literacy. In chapter 4, I found that the scores on these two items identified the children with reading difficulties more than the scores on identifying the initial sound in a word. At the same time, it indicates that the grade 1 children benefited from the teaching. The results show that the children with learning problems (group 1) experienced more difficulties on the additive tasks (numeracy) than the other tasks. It means the children had limited knowledge on numeracy.

Some strategies such as "*I do not know*", "*eye contact*" and or "*guessing*", "*frequent erasing*" *and* "*small size drawings*" were used in more than one task. The type of the "on task" coping strategies (no talking) used by grade 1 children was a step to move towards "avoidance" coping strategies.

5.2.1.1.5 Categorizing the children based on the coping strategies

I categorized the children with learning problems (group 1) into four groups based on the use of coping strategies and the type of coping strategies they used.

Table 5-3The number of cases in group (1) that used either "on task" or "avoidance" coping strategies, both strategies, or neither strategies (n=95)

Task	# of children On task coping strategy	# of children Avoidance coping strategy	# of children Both coping strategies	# of children Neither strategy
Phonological awareness (reading task 1)	-	-	-	All children
Phonological awareness (reading task 2)	8	1	1	85
Phonological awareness (reading task 3)	5	1	0	91
Concepts of Print	13	2	1	75
Drawing Human Figure	12	2	0	76
Writing Own Name	1	-	-	94
Writing a letter	22	3	2	68
Copying oblique shapes	16	2	2	72
Numeracy (Additive tasks)	25	2	2	61
No of cases Across all items with no repetition	43	11	5	38
Mean of age Age range	75.5 5.2- 8.6 years	74.6 5.4- 7.4 years	78.6 5.5- 7.8 years	80.82 5.4- 7.8 years

Each horizontal raw in Table 5-3 represents a task from the test. For instance, the first task is task 1 in phonological awareness (reading) which is identifying the initial sound in a word. The cases in this task are independent of the cases in the rest of the table. A child might use more than one coping strategy in this task, and at the same time this particular child uses the same or another coping strategy in tasks 2, 3, 4, or 5. The sum at the end of each row is the number of the children with learning problems who used coping strategies in a particular task. Table 5.3 shows that the children with learning problems used more "on task" coping strategies than others.

Only 5 children used both "on task" and "avoidance" coping strategies. These children were older children.

5.2.1.1.5.1 The styles of coping strategies some children with learning problems used

I found that the children with learning problems used a variety of styles of negative coping strategies for the same task. Table 5-4 shows the styles of the coping strategies the children with learning problems used on each task in the test.

Table 5-1 The number of children with learning problems who used coping strategies on the test items and the number of different styles of negative coping strategies used on each item (n=95)

Item	No. of children	Styles of coping strategies
Additive tasks	30	6
Writing a letter	27	4
Writing name	1	1
Drawing a human figure	18	3
Copying a diamond	19	2
Phonological awareness	18	4
Concepts of print	16	6
Total	129	26

The results in Table 5-4 show that some children with learning problems used more styles of coping strategies on the additive tasks and concepts of print. These children used both "on task" coping strategies and "avoidance" coping on these two subtests. It indicates that these two tasks were very difficult for the children. In chapter 4, the additive risk model showed that these two areas predict the children's future learning problems in reading, writing and numeracy.

On the additive tasks, the preschool children with learning problems used five styles of coping strategies as seen in Tables 5-1 and 5-2; whereas the grade 1 children with learning problems used only three styles of coping strategies. The preschool children used two styles of "on task" coping strategies and the other three styles of coping strategies were "avoidance" coping strategies. The grade 1 children used three style of "on task" coping strategies when they worked on the task. On concept of print, the preschool children used five styles of coping strategies, and the grade 1 used only

one style of coping strategies. The preschool children use four styles as "on task" coping strategies and one as an "avoidance" coping strategy. The grade 1 children used the coping strategy as an "avoidance" coping strategy.

Some preschool children used the coping strategies in three to four tasks. For instance, a preschool girl used the following:

1. She used guessing in reading task 2 (phonological awareness). An example is:

   Researcher: I placed in front of the girl pictures of 3 objects a duck, a bee and a tree. I named the objects in Arabic.

   Researcher: "These are: *bata, nakla and nahla".*

   Researcher: "I want you to point at the two words which begin with the same sound".

   The girl: *She kept moving her finger from one picture to another. She did the same with the rest of the tasks and she was looking at me waiting to say correct or incorrect.*

2. She used guessing on concepts of print. An example is:

   Researcher: I placed the storybook in front of the girl. I pointed at one page.

   Researcher: "I want you to show me a word on this page".

   The girl: *She pointed at one word.*

   Researcher: "What is the word?"

   The girl: "*eats*".

   The word is not eats. Her answer was from the picture.

3. She used frequent erasing on the human figure.
4. She used pretend to write in the letter to her mother. An example is:

   The girl: *She drew her mother figure and it is in front of her.*

   Researcher: "I want you to write a letter to your mother".

   The girl: *She wrote the letter.*

   Researcher: "Can you tell me what did you write to your mother?"

   The girl said: "*Madrasati feha saadati*".

   A translation is: "My happiness is in the school".

   The girl wrote some joined Arabic letters, but has no meaning for a reader.

5. Small drawing of a diamond shape. An example is:

Researcher: I placed in front of a girl a blank paper and a pencil. I put a plastic circle in front of her above the paper.

Researcher: "I want you to look at this circle and draw it on the paper".

The girl: *She drew a circle.*

Researcher: I took away the circle and put a square in front of the girl.

Researcher: "I want you to look at this square and draw it on the paper".

The girl: *She drew a small square.*

Researcher: I took away the square and placed a triangle in front of the girl.

Researcher: 'I want you to look at this triangle and draw it on the paper".

The girl: *She drew a triangle.*

Researcher: I took away the triangle and placed a diamond shape in front of the girl.

Researcher: "I want you to look at this diamond shape and draw a diamond on the paper".

The girl: *She drew a shape.*

The girl drew a correct circle, square and a triangle. She drew the square smaller than the circle and the triangle smaller than the square. When I asked her to draw the diamond she drew a shape which has two clear angles and it does not look like a diamond. It is very small in size. It is difficult to see if there is a third angle. On the same day, the girl drew a large human figure, and she used large letters in her letter.

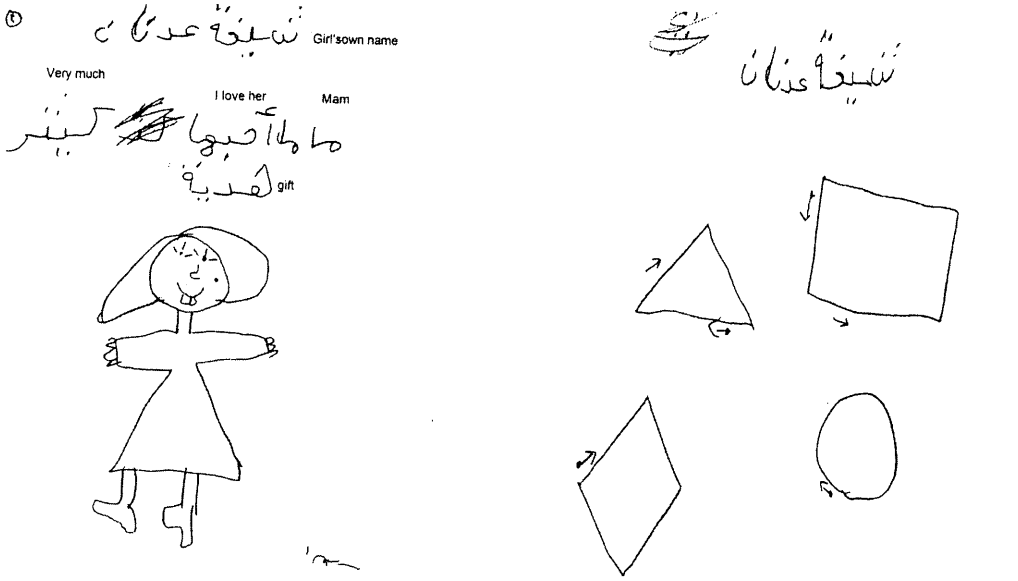
Figure 5-1 Some examples of children's work to show that drawing a small diamond shape can be a negative coping strategy for a child



(1) Preschool girl



(2) Preschool girl



(3) Grade 1 girl

Figure 5-1 shows some examples of the children's work. In the figure, the drawing of child 1 was for the girl, who used the above five coping strategies. The girl drew a very large complete figure of her mother. On the top right, she wrote her own name, correct and in large size. On the top left is the letter which she wrote to her mother. It was a string of joined letters with no meaning. Only her name at the end of the letter was clear. The diamond shape was not correct and it is smaller in comparison to other shapes, her name and the drawing of her mother figure. The girl's work indicates that she was confident when she drew her mother figure, wrote her own name and drew the first three shapes from the right. She did not show the same confidence when she wrote the letter to her mother and drawing of the diamond shape.

Child 2 is a girl from the preschool too. The girl drew both the triangle and the diamond shapes smaller in size than the other shapes; also the two shapes are smaller than the human figure and the two names at the bottom right. The girl's name is on the top and bottom left. It is not correct and it is smaller than the other two names at the bottom. The girl just wrote two peoples names, Ahmed and Nora as a letter.

Child 3 is a girl from grade 1. This girl drew a complete figure of her mother with details and in a large size. She wrote her full name correct and in a large size too. She wrote a complete meaningful sentence in the letter to her mother. It was in large size letters. She drew the four shapes correct, and in the same size. The girl's work

indicates that she was confident, and knew what she was doing. The work in the figure shows that the size is used as a coping strategy to deal with the difficulties in either drawing or writing.

The children used small size drawing or writing as a coping strategy when they find the academic task not familiar or difficult.

5.2.1.2 Typically developed children and coping strategies

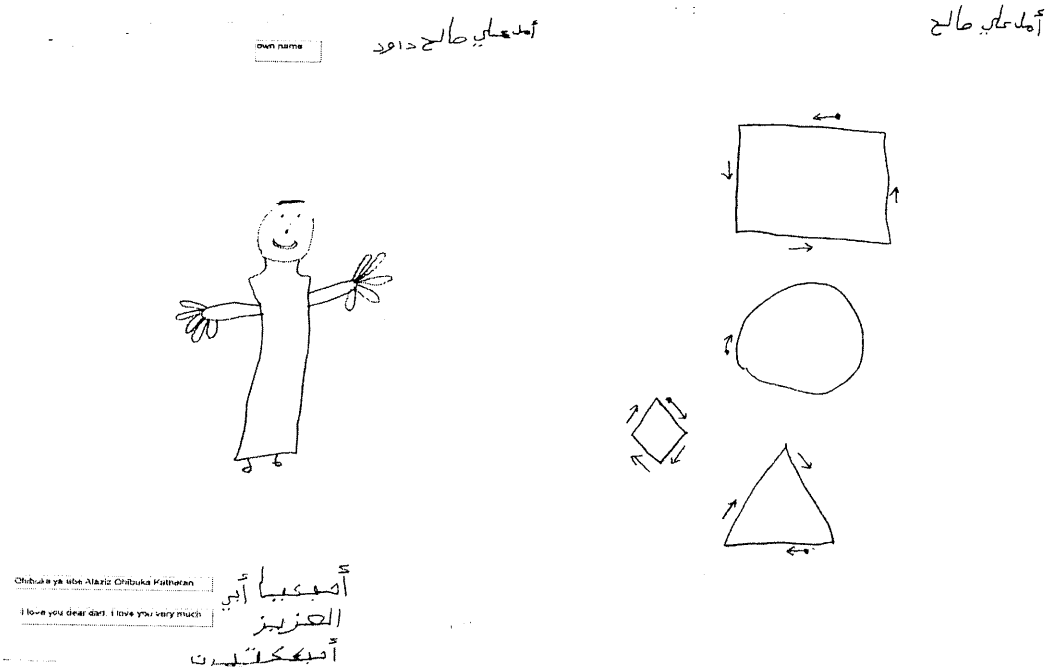
All the typically developed performed very well on the test. In relation to writing, all of them drew a conventional human figure. They wrote their names very clearly, and they wrote one to two meaningful sentences to their favourite persons.

Table 5-4 Classification of the negative coping strategies based on its type and the class level in typically developed children (group 2, n=50)

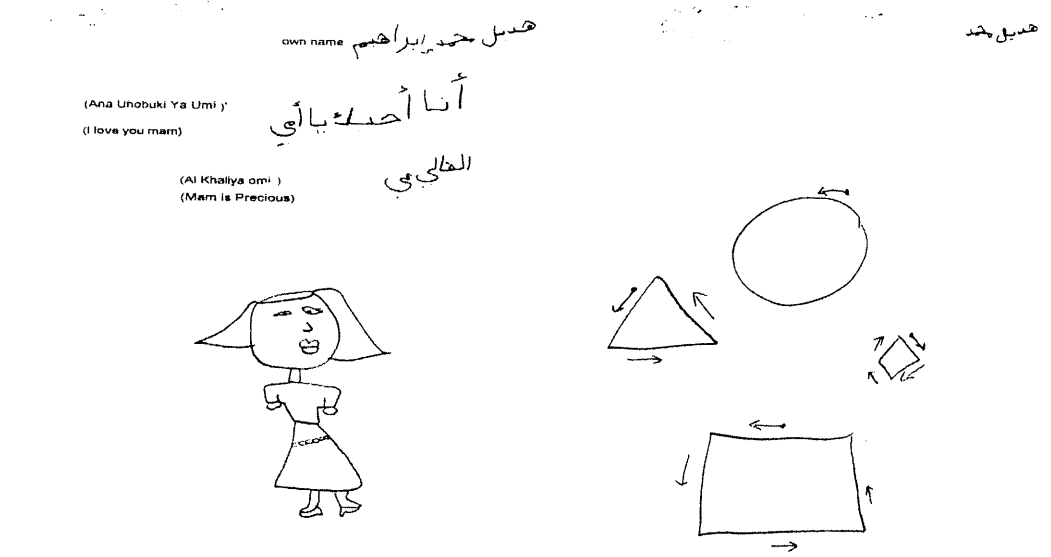
Coping strategy	Example	Area	No. of children	Total
On task coping strategies	Small drawing	Diamond	11	11
Avoidance coping strategies	-	-	0	0
	Total		11	11

Table 5-5 shows that 11 of the typically developed children drew a correct diamond shape. It was smaller than the other shapes. This is 22% of typically developed children. The girls used more of this coping strategy than the boys. The percentage of girls was 72.73% and, the percentage of boys was only 27.27%. It is possible that copying a diamond shape on the test was the children's first experience with a diamond, so they were struggling with the task. Figure 5-2 shows the difference in the size of the diamond shapes and other shapes.

Figure 5-2 The typically developed children, who performed well on the test drew a smaller diamond shape in comparison to other shapes



Grade 1 girl



(2) Grade 1 boy

It can be concluded that the children used coping strategies in two cases. First, if they were not familiar with the task. Second, they found it difficult to do the academic task even if they had previous experience.

5.3 Case studies

In this section, I want to investigate if there are aspects, other than academic, which might influence children's performances in the school. I discuss the five cases of children who used both "on task" coping strategies and "avoidance" coping strategies. To ensure confidentiality, I used the following pseudonyms for the children: Amal, Huda, Yousif, Fatima and Mariam. Amal and Huda are from the preschool. They joined grade 1 in September (2006-2007). Yousif and Fatima were at the end of grade 1 during May (2005-2006). Fatima was in grade 1 in the beginning of the year (2006-2007), but she was repeating grade 1 (kept in the preschool group). I used these children because the special education and the social workers provided me with enough information about them the following year. I had a personal interest in Mariam. I wanted to know if she continued using: *"my stomach is paining me"*.

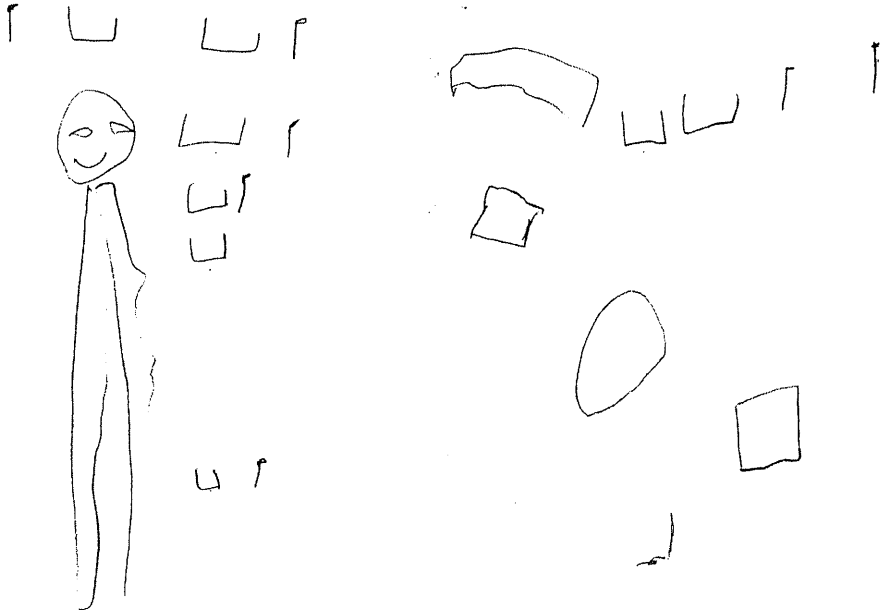
5.3.1 Amal

Amal was a preschool girl, who was born on 20/8/2000. The following are her results on the test:

Area of the test	Percentage of correct answers/ what the child can do	Difficulties
Phonological awareness	Amal got 19% of the tasks correctly	She had more difficulties with identifying the shared sound both in the beginning and at the end of two words than identifying only the initial sound in a word
Concepts of Print	- Amal was able to hold the book in its appropriate position, and open it. - She identified the story in the book.	- She could not read the story from the beginning. - She could not point at either the front or the back of the book. She could not point at some letters or words in the storybook.
Writing	Amal did not write her name correctly. Writing a letter: On the first line she wrote a and ba (the first two letters in Arabic alphabet). Then she wrote them again on the same line, but this time ba was before a. She did not write the dot under ba. On the second line she wrote a and ba and a This time she wrote the dot under ba. On the third line she wrote only ba and she missed the dot. On the fourth line she wrote a and ba. She wrote the do under ba	She did not write meaningful words.
Drawing human figure	Amal drew a tadpole	She could not draw conventional figure
Coping shapes	Amal drew a circle and square	She could not draw both triangle and diamond
Numeracy	Amal was on Stage 0 in counting.	She cannot count visual counters. She skipped one counter while counting.

Figure 5.3 shows some of Amal's work.

Figure 5-3 Amal's work during the interview (children with learning problems)



The class teacher evaluated Amal as very weak in her academic attainment in the class. The following are other circumstances that might have an impact on Amal's achievement in the school:

Grade	Coping strategy during the interview	New coping strategies the following year	Home/ school circumstances and others
Amal repeated grade 1 the following year after the interview	"On task "coping strategies - Pretend to write - Small drawing of Diamond	"On task "coping strategies - memorized texts and read them from her memory - "Taught strategy" in numeracy "Avoidance" coping strategies - She hides her book under her desk - She had no pencil - She does not attend the school on a regular basis in order to avoid the class work - Aggressive behaviour towards peers	Based on the head teacher saying the year of the interview, the school did not have teachers who know how to catch the children attention and communicate with children

The teacher mentioned that Amal was quiet last year. It is possible that Amal had had negative communication with her teacher. These two aspects contribute to Amal's difficulties in her academic achievement. The following year, Amal repeated the same grade. She was kept with the same teacher and she lost her friends. As a result of that, Amal added more coping strategies the following year. She used "avoidance"

coping strategies which were not used on the previous year. It is possible that the difficulties and "on task" coping strategies which involved no talking lead to low self-esteem.

5.3.2 Huda

Huda was a preschool girl, who was born on 05/10/2006. The following is Huda's performance on the test:

Area of the test	Percentage of correct answers/ what the child can do	Difficulties
Phonological awareness	Huda got 52% of the tasks correct.	-She had more difficulties identifying the shared sound both in the beginning and at the end of two words than identifying only the initial sound in a word
Concepts of print	Huda was able to hold the book in its appropriate position, and opened it. She identified the story in the book.	She could not read the story from the beginning. She could not point at either the front or the back of the book. - She could not point at some letters or words in the storybook.
Writing	Huda wrote her name but one letter is missing a dot. She did not write anything for the letter.	She did not write meaningful words. Coping strategy: She pretend to write
Drawing human figure	Huda drew a transitional figure.	She could not draw conventional figure.
Coping shapes	Huda drew a circle correct.	She could not draw square, triangle and diamond.
Numeracy	Huda is in stage 0	She cannot count visual counters. She skipped some counters

Figure 5-4 shows some of Huda's work during the interview.

Figure 5-4 Huda's work during the interview (children with learning problem)



Huda was not attentive during the interview. The results show that Huda did not perform well on the test. The class teacher evaluated Huda as very weak in her achievement. The following are other circumstances that might have an impact on Huda's achievement in the school:

Grade	Coping strategy during the interview	New coping strategies the following year	Home/ school circumstances and others
Huda repeated grade 1 the following year after the interview	"On task "coping strategies Pretend to read the story "Avoidance" coping strategies "I want to go, and "the teacher wants me"	"Avoidance" coping strategies - She does not attend the school on a regular basis in order to avoid the class work	Parents are divorced and she lives with her mother. Her mother is emotionally disturbed. The father has another wife. The girl is more attached to her father, but she has difficulty to contact him. The school social worker tried to contact her parents, but no response

Huda had had difficulties on most of the tasks and her class teacher indicated that she was weak in schoolwork. I observed that Huda was not attentive during the interview. I think Huda was neglected at home. She did not have enough attention at home due to her mother's sickness and father's engagement in his work and the other home. It seems that Huda had a better relationship with her father, but he was not there for her. These problems made Huda inattentive in the class, and it had an influence on her academic achievement. She used both "on task" and "avoidance" coping strategies during the assessment. The result was that she repeated grade 1. Failure added more pressure on Huda. It is possible that her parents did not accept it, and at the same time she was separated from her friends. She lost interest in school and she began to miss classes.

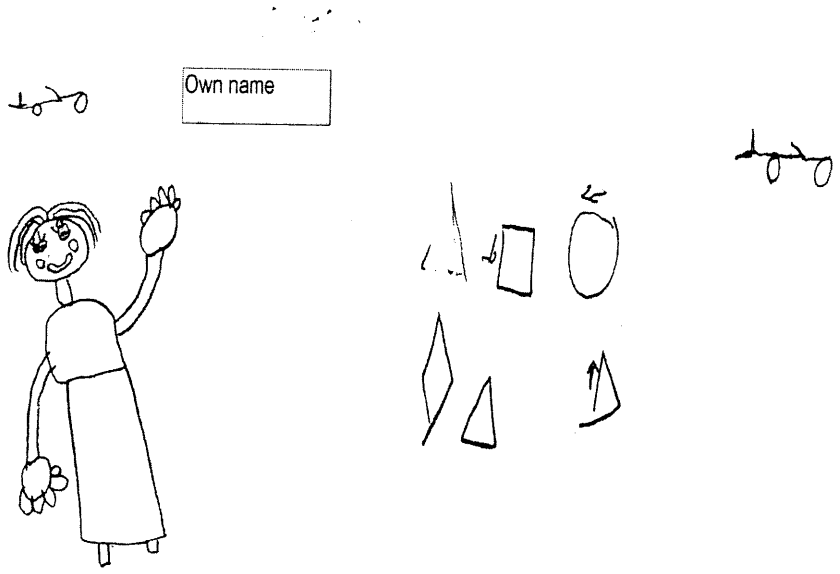
5.3.3 Yousif

Yousif was a grade 1 boy, who was born on 19/8/1999. In the test, Yousif did the following:

Area of the test	Percentage of correct answers/ what the child can do	Difficulties
Phonological awareness	Yousif got 30% of the tasks correct.	He had difficulties on all the three items of the phonological awareness
Concepts of print	Yousif pointed at the front part of the book. He Pointed at some words.	He was able to hold the book in its appropriate position, and open it. He could not identify the story in the book. He could not read the story from the beginning. He could not point the back of the book. He could not point at some letters.
Writing	He wrote his first name only He did not write a letter	
Drawing human figure	He drew conventional figure of his mother	
Coping shapes	Yousif drew all the four shapes correct	
Numeracy	He was on stage 1: He counts visual counters	He cannot count hidden counters

Figure 5-5 contains some of Yousif's work during the assessment.

Figure 5-5 Yousif's work during the interview (group of children with learning problems)



Yousif did not do well on the main parts of the test. He was at the end of grade 1 during the assessment. I expected him to read, write some sentences and do some counting. The class teacher evaluated Yousif as very weak in his academic achievement. The following are other circumstances that might have had an impact on Yousif's achievement in the school:

Grade	Coping strategy during the interview	New coping strategies the following year	Home/ school circumstances and others
Yousif Repeated grade 1 during the interview and grade 2 later	"On task "coping strategies Yousif drew the diamond very small in size. "Avoidance" coping strategies Yousif said: "I cannot write my full name, I cannot write. They did not give me	"Avoidance" coping strategies He Talks a lot during the lessons and disturbs other children	During the assessment I observed that Yousif was a social child The class teacher always asks him to stop talking

Yousif had low achievement on the school competencies at the end of the year, but the system of the evaluation in Bahraini primary school transferred him to grade 2. In the following year (2007-2008), he repeated grade 2. It is possible that Yousif used more "on task" coping strategies the year before the interview, as noted for the previous three children. It seems that Yousif's personality is an important aspect in his failure and coping strategy. It is possible that the class activities did not motivate Yousif enough. He might need to work in a group or have more attention from the teacher and other children.

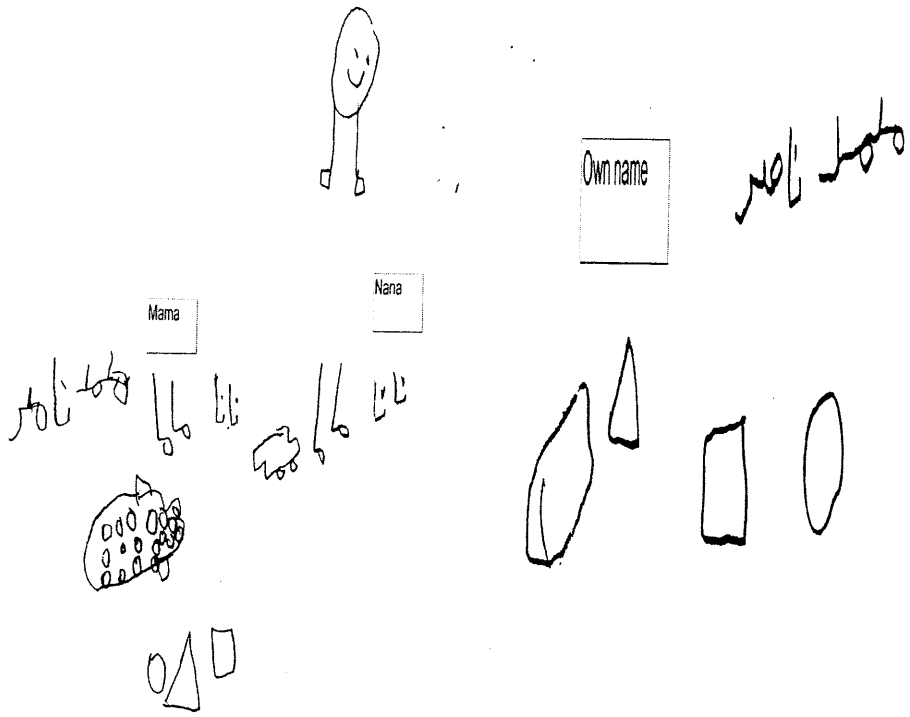
5.3.4 Khalid

Khalid was a grade 1 boy. He was born on 22/11/1999. He repeated the class during the assessment. On the test, he did the following:

Area of the test	Percentage of correct answers/ what the child can do	Difficulties
Phonological awareness	Khalid got 44% of the tasks correct.	He had more difficulties on identifying the share sound in the beginning or at the end of two words than identifying only the initial sound in a word.
Concepts of print	Khalid pointed only at some words	These tasks were very difficult for Khalid.
Writing	Khalid wrote his first and middle name. In the letter, he wrote a syllabus "Nana" twice	_____
Drawing human figure	Khalid drew a tadpole	_____
Coping shapes	Khalid drew circle, square and diamond	He could not draw a diamond
Numeracy	Khalid was on stage 0. He skipped some counters while counting	He cannot count visual counters

Figure 5-6 presents some of Khalid's work during the interview.

Figure 5-6 Khalid's work during the interview (group of children with learning problems)



The results supported his class teacher's evaluation that the child was very weak in his academic performance. He used two coping strategies.

Grade	Coping strategy during the interview	New coping strategies the following year	Home/ school circumstances and others
Khalid repeated grade 1 during the interview	"On task "coping strategies Guessing on additive tasks. "Avoidance" coping strategies As avoidance coping strategy, he used: "I want to go to class" during reading of print.	No information	The class teacher described Khalid as a quiet child. Parents do not attend open days

At the end of grade 1, Khalid must be able to read and write some words and do some counting. It is possible that Khalid's personality and repeated failure did not help him to build appropriate communication with the class teacher and his peers.

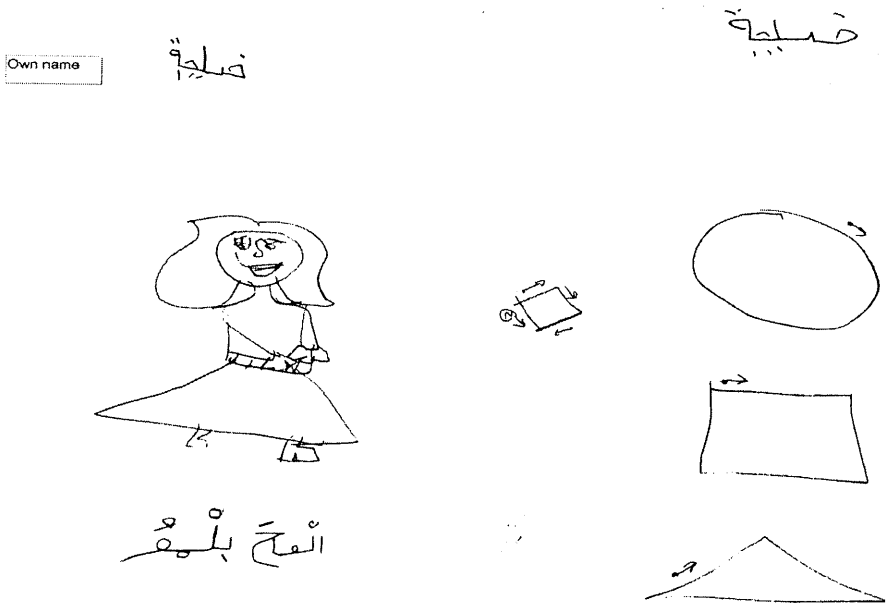
5.3.5 Mariam

Mariam was a grade 1 girl, who repeated grade 1 during the interview. I placed her in the preschool group (in the beginning of the year). On the test, she did the following:

Area of the test	Percentage of correct answers/ what the child can do	Difficulties
Phonological awareness	Mariam got 33% of the tasks correct	She experienced difficulties with the phonological tasks
Concepts of print	Mariam opened the book from right to left. She pointed at the beginning of the story.	Mariam had difficulties on identifying the story part, pointing at the front, back of the storybook. She could not point at some letters, and words in the storybook. She could not read.
Writing	Mariam wrote her first but it was missing one letter. She did not write anything for her mother.	She had difficulties in writing She might have communication problem with her mother.
Drawing human figure	Mariam drew a conventional figure of her mother.	_____
Coping shapes	Mariam drew circle, square and diamond.	_____
Numeracy	Mariam was on stage 0 in counting. She skipped some counters while she was counting.	She could not count visual counters

Figure 5-7 presents some of Mariam's work during the interview.

Figure 5-7 Mariam's work during the interview (group of children with learning problems)



The following are some of the circumstances that might have had an influence on Mariam's performance in the school:

Grade	Coping strategy during the interview	New coping strategies the following year	Home/ school circumstances and others
Mariam repeated grade 1 during the interview.	"On task "coping strategies She used "rhymes" on the additive tasks Small drawing of the diamond "Avoidance" coping strategies She used "my stomach is paining me"	No coping strategies	-Mariam had a heart problem and visual impairment. She put her head close to the book in order to read. -I asked her class teacher if the girl was sick on that day. The teacher replied that the girl had a habit to complain about her stomach, but she had no pain at all. I think Mariam has a communication problem with her class teacher. It is possible that the teacher judged Mariam based on her appearance. The following year, Mariam was placed with another teacher and she improved a lot in her academic achievement.

Mariam had difficulties in reading, writing and numeracy. It is possible that her health problem contribute to her low achievement in the class. Mariam's use of an avoidance coping strategy indicates that she was not comfortable in the class. The class teacher's reply shows that she does not understand why Mariam was using this coping strategy. She thought it was a normal thing. The teacher did not build a good relationship with Mariam, so Mariam did not pay attention to class work. Mariam repeated grade 1 with the same teacher. This might cause low self-esteem. The school social worker was following Mariam's progress. The following year in grade 2, Mariam was placed with another teacher. The social worker told me that Mariam changed completely, and she was doing well. She indicated that the new teacher seemed to know how to communicate with Mariam. She added that Mariam herself was aware of the change, and she said to her: "*I was different last year, right*". It is possible that the girl had a problem either on the task or in communicating with her class teacher.

There are some common aspects among the five cases:

- Difficulties on the test
- Low achievement in the school
- Repeating the same grade

- Use of coping strategies

Amal and Huda added the "avoidance" strategies on the following year. It is difficult to identify whether the other children did the same. When, I interviewed them, they applied the two types of coping strategies. According to Table 5.3, the age range for the five children at observation was 5.5-7.8 years. It shows that these five children were older than the other children, who used "on task" coping strategy only or "avoidance" coping strategy only. From the cases details, I think Yousif, Khalid and Mariam added the "avoidance" coping strategy.

It is possible that some aspects, other than academic, are involved in the children's difficulties on academic tasks and made the children inattentive in the class. These are the child's personality, home atmosphere and poor interaction with class teacher. These aspects might contribute to these children's difficulties in the school. Failure resulted in production of more negative coping strategies, specially "avoidance" ones.

5.4 Performance of the children on the test

This section presents some details on the children's performance on various academic tasks.

5.4.1 Early reading

This section presents some comments on the children's performances on both phonological awareness and concepts of print awareness. Then, I mention some comments on the discussion on reading strategies with some teachers in the primary schools, and kindergartens.

5.4.1.1 Phonological awareness

In this section I am going to make some comments on the performances of both the children with learning problems and typically developed children on phonological awareness tasks.

5.4.1.1.1 Children with learning problems

The main comment on phonological awareness is that most children could not distinguish between the name, and the sound of the letter. For instance, I asked the children what are the two words that begin with the same sound? Then, I asked them what this sound is? They gave me the name of the letter and not the sound. I repeated the instructions several times. Some children did not listen carefully to the instructions, and jumped to the answer. It appeared that some of the children did not understand what is meant by the sound in the word. It is possible that they had not come across this term in their previous experiences. I observed that some children in the group of children with learning problems created the sound that the object in the picture produced, when they were asked to say the first sound in the word. For instance, two children whistled like a bird. They did the same thing with the sound of a horse, a plane, and a train.

In task 3, when I asked some children with learning problems to identify the two words that end with the same sound such as "ʃɑnta", "bɑhər", and 'thawr", a few of them pointed at the pictures of "ʃɑnta" (bag) and 'thawr" (bull) instead of "bɑhər" and "thawr", which end with "rɑ" . They used the local dialect on pronunciation of tha as "fa" in "thawr". The same thing was observed with the word, which was pronounced as "ʊðən", when the children selected "di ː k" and "ʊðən" as the correct answer instead of "ɑyɑn" and "ʊðən", which end with "nɑ".

After I had explained the instruction in task 3, some children looked for the two objects that began with the same sound. As a result, I repeated the instruction several times. I noticed that some children began with one strategy, such as identifying the initial sound in the word, and they continued to do so in the next tasks 2 and 3. Also, I observed that the repetition had an influence on their answers. For example, when I said the words and one child responded: *"I do not know"*, I repeated the instruction. As soon as I finished the instruction, the child moved his pointer finger on the pictures and looked in my eyes in order to get my approval. When I saw that, I tried to avoid eye contact at this time.

Guessing played an important role in the children's selection of items in subtests 2 and 3, where the children had three choices. For instance, in subtest 2, the second and the third word in the example begin with "dɑ". A preschool girl selected the second and the third words as an answer in all the tasks.

Identifying the shared sound at the end of two words was the most difficult task. It is possible the children had more experience with identifying the initial sound in a word than the other tasks or phoneme is more important in Arabic language than the rime.

5.4.1.1.2 Typically developed children

In my interviews with the typically developed children during the phonological awareness section, I observed that these children had expereinced the same confusion as the children with learning problems experienced when considering the name and the sound of the letter. In the example, I tried to explain that a letter has a name and a sound. I pointed at the picture and I said this is "sariər". The name of the first letter in this word is "seen" and the sound is "sa". Two children found identifying the shared sound at the end of two words difficult, but they did not use any coping strategy.

5.4.1.2 Concepts of print

This part is composed of two sections. In the first section, I discuss the responses of the children to reading an Arabic storybook and identifying some items in the storybook. I describe the performance of both the children with learning problems, and the typically developed children on concepts of print. In the second section, I write about the difficulty that some children experience with two concepts of print, and the front and the back of the storybook. I shared this matter with some class teachers in order to understand the problem.

5.4.1.2.1 Children with learning problems

I asked the children with learning problems to read a storybook. I got different responses. Some children said: *"I do not know"*. I observed that 25.53% of the preschool children who moved their pointer finger pretending to read. 66.67% of them invented their own stories from the pictures on the page in front of them. On the

page, there was a picture of a girl with her mother having breakfast. The following are examples of the children's readings:

1. One girl read: "*Shucran Allaha. Shucran umi altaam latheethe*". A translation is: Thanks god, thanks mum the food is delicious.
2. A boy began his reading with "*Kaan ya makaan fe khadeem alzaman*". A translation is "once upon a time". It seems that his teacher used this statement during story time.
3. Another girl read: "*Besmellah alrahman alraheem. Ana umashat shari ana aroh almadrsa*". A translation is: "In the name of god..... the merciful. I comb my hair: I go to school".
4. A few preschool children read different stories from their memory. For instance, a boy opened the storybook, and moved his finger on the inner part of the cover page, and he said: "*Usby yadrabny*". A translation is: "a boy is beating me..."
5. At least four children from the preschool recited some verses from the Quran.

On identifying some items from the storybook, a few preschool children used guessing. An example is:

Researcher: The book is in front of a boy. I pointed at a page in the story book.

Researcher said: "I want you to show me a letter".

The boy said: "*Mohanad*" (a name of a boy).

Researcher said: *"Where is Mohanad"?*

The boy: Pointed at a word.

Mohanad was not a character in the story, but it is a character in a T.V drama. On identifying the different parts of the story, I found 19% children who could point at the front of the book and 15% who identified the back part of the book.

5.4.1.2.2 Typically developed children

On my interviews with the typically developed children who were only from grade 1 children, I found that the children could read the storybook very well, and they could hold the book in a proper position. They could also open it from right to left. 56% of them identified the print as the story. 66% of the children pointed at the front. 84% of

the typically developed children identified the back of the storybook. All of the children could point at some letters and words. They could read them too.

5.4.2 Writing

In this section, I discuss the performance of the children with learning problems and the typically developed children on the four items of the writing subtest. I begin with writing own name, and I include with it drawing of the human figure and writing a letter to a favourite person. It is followed by copying the fours shapes, the circle, square, triangle and diamond.

5.4.2.1 Writing own name

Regarding writing own name, most of the children were able to write their own names. All the typically developed children wrote their full names very clearly. The percentage of children with learning problems who wrote their first names correct and in reasonable size and on horizontal line was 75% children from grade 1 and 70.21% children from preschool. 21.2% of the children with learning problems wrote the letters big or in different sizes. They left uneven spacing between the letters. The number of the children who did not write their names was only five, and they belonged to the preschool.

5.4.2.2 Drawing of human figure

In this part, I compare the human drawing for the typically developed children and the children with learning problems.

Table 5-2 Comparison between the typically developed children and learning with learning problems on drawing of human figure

Criteria	# of typically developed children (n=50)	# of grade one children with learning problems (n=48)	# of preschool children with learning problems (n=47)
Conventional figure	All the children drew conventional figure with fine details in face, hair, neck, torso, arms, hands, legs and feet.	36children conventional with ace, torso, arms, legs and feet	26 children drew a conventional figure consists of a head, face, torso, arms and legs. Face lacks at least one feature. Some children drew arms and legs as two lines. Hand.
Location of body part and structure	On girl drew arms attached to the head. Hands and feet like hooks. One child drew head as a rectangle and the neck was a line attached to it.	_____	One girl used squares for the hands, string of beads for the fingers, two triangle for the feet and beads for the toes.
Details in hands and feet	A round 33 children added fingers to the hands. 17 children drew toes in the feet or shoes	20 children added fingers to the hands. 10 drew toes or shoes.	14 children added fingers to the hands. 8 children drew toes or shoes.
Stick man	2 children drew stick man. One child drew the hair. The other drew the fingers and the toes as lines.	_____	3 children drew stick man with face features and hair
Location of the drawing on the paper and the size of the body parts	All the drawing were in the middle of the page and the size of the head appropriate to the rest of the body	23 children drew the size of the head appropriate to the size of the rest of the body. 42 of the drawing were in the middle of the page	13 children drew the size of the head appropriate to the size of the rest of the body. 33 of the drawing are in the middle of the page
Other types of the figure	No transitional figure No tadpole	8 children drew transitional figure. 4 children drew tadpole figure.	13 children drew transitional figure. 10 children drew tadpole

Table 5-6 shows that all the typically developed children drew a conventional figure with fine details. The quality of their conventional figure was better than the other two groups with learning problems. They drew in the middle of the page and the size of the head was appropriate to the rest of the body. It means they were able to transfer their internal model to the paper and use appropriate hand eye coordination in the space. They developed the sense of part to the whole relationship when they consider the size of the head to other parts of the body. Grade 1 children with learning problems drew a more conventional figure and better than the preschool

children. Both grade 1 and preschool with learning problems need to develop eye and hand coordination on the space. Children need to estimate the size of the parts in relation to the whole body when they place their drawings on the paper. These skills are important in reading, writing and numeracy. The drawing of human figure identified children with learning problems.

5.4.2.3 Writing a letter

When I asked the children to write a letter to their favourite person, some of them said: *"I do not know"*, so I said to them: *"do not worry about what you do not know just write what you know"*. I found that eight children from grade 1 and seven children from the preschool drew an envelope. When I repeated my question, they said: *"This is the letter"*. They thought that the envelope is the letter. I said: *"That's fine, can you write some words to your mother or father?"* Some of them wrote their words inside a small envelope. Others asked me where to write the letter. One girl in grade 1 asked me how to write one of the letters, I said to her: *"there is no right or wrong in this activity, just write how do you think this letter looks like?"*. She turned her head around in the class, looking at some charts on the wall in order to find the letter she was looking for. The following are the details on the children's construction of writing a letter.

5.4.2.3.1 Grade 1 children with learning problems

91.17% of the grade 1 children with learning problems had an attempt at writing a letter and the rest either wrote their own name or their mother's name. 37.5 % of the grade 1 children with learning problems wrote something that looked like a letter.

5.4.2.3.1.1 Audience

10.42% of the children wrote their letters to a particular audience. 8.33% of them wrote a letter to their mothers. 2.1% of the children wrote a letter to a teacher.

5.4.2.3.1.2 Purpose

10.42% of children expressed their love to a mother or a teacher. One girl wrote the letter the way she pronounced it. She connected two words together. 8.33% of the letters had spelling mistakes. Three girls wrote their full names with clear and correct

spelling. One of them wrote her name at the end of the letter. All the children drew a conventional figure. Only one of them copied the diamond correctly.

Few children expressed their love to a person but no particular audience. It was like a statement. Three girls wrote that they love their mothers, but no audience. One of them joined two sentences together. She wrote the way she pronounced the words. She used a letter in a place of a marker. This girl wrote her full name. She drew a conventional figure. She copied the diamond in her second trial.

Another purpose was thanks. 4.17 % of the children wrote thanks letters. They wrote two sentences. One of them said in the first sentences something like Mum you taught me. Then, she said: thank you mum "أمي انتي علمتني وشكرن لكي يا أمي" . This girl wrote her letter the way she pronounced the words. She used letters in the place of markers. She joined the two sentences together. The other girl said: "Mum is beautiful. Thank you Mum."أمي جميلة أمي شكرا". This girls used period at the end of the sentence.

A third purpose was informative and request. One girl wrote a letter to her father. She wrote: " في المدسة قصص تيبلي هديةبابا " . A translation is: "Dad in the school stories bring me a gift". She used local dialect in her writing and she has spelling mistakes. This girl left one letter in her name too. The children wrote the sentences on a straight, horizontal line, from right to left. They used appropriate size and the spacing between the words and the letter within the words were even and the same.

10.42 % of the children wrote descriptive letters. They described a mother as beautiful or as a flower and a father as handsome or as a flower, but with no audience. 8.33% of them used two sentences with no punctuations. One of the children wrote her name at the end of the letter. These children wrote their names correctly. Two children drew a conventional figure, two drew a transitional and the rest of the children drew a tadpole.

5.4.2.3.1.3 Oral language

Around 25% of the children used their oral language in their letter writing. They wrote the words in the way they pronounced them. As in the above examples, some children used letters in the place of markers.

5.4.2.3.1.4 Structure

All the grade 1 children, used same size of letters. This includes the children who wrote on a horizontal line from right to left, and the children who wrote few letters or invented words.

5.4.2.3.1.5 Benefit of teaching

16.67% of the grade 1 children used markers and period in their writing. Some of them wrote non-meaningful words and missed one letter in their names.

5.4.2.3.1 Preschool children with learning problems

76.6% of the preschool children had an attempt to write a letter. 13.89 % of the preschool children wrote something that can be read as a letter.

5.4.2.3.1.1 Purpose

40% of the children wrote a letter to their mothers to express their love. One girl wrote something like "my mother is dear and I am excited to see her". Another girl wrote two sentences. She wrote something like "I love mum. Mum is in my heart". This girl used a verb that is not used during every day social interaction. A girl just wrote thanks Mum. A boy wrote to his father and he said something like "my father the handsome". These children wrote their names with clear and correct spelling. The three girls drew a conventional figure and the boy drew a transitional figure. All of the four children could not copy the diamond.

5.4.2.3.1.2 Structure

8.33% of the children wrote one to three meaningful words such as flower and apple. The words had no link among them. These children wrote their names with complete and correct spelling. They drew a conventional figure, but they were not able to copy the two oblique shapes.

27.76% of the children wrote one to four invented words that have no meaning for a reader. These words were written on a straight horizontal line from right to left. The size of the words was big. All of them wrote their own names with correct spelling and letter formation except two who left out one or two letters. 50% of them drew a

conventional figure, 4% of them drew a transitional figure and only 1% of them drew a tadpole. These children could not draw the two oblique shapes or only the diamond.

13.89% of the 76.6 % wrote separate letters on a horizontal line. The words were not grouped together. 75% of them wrote their names with correct spelling, but missing some criteria. 35% of them drew a conventional figure, but they did not manage to copy the shapes correctly. The other 35% of children drew a transitional figure. They could not copy the four shapes correctly. Only one child wrote his name, but missing some letters and other criteria. He drew a transitional figure. These children could not copy the four shapes.

8.33% of the children wrote only few repeated numbers and one of them wrote the numbers in English and added few English letters. 66.66 % of them wrote their names correctly and drew a transitional figure. The rest of them wrote their names missing some letters and other criteria. They drew a tadpole figure. All these children did not draw the shapes correctly.

13.88% of the children produced scribbles similar to letters and numbers. Most of them wrote them on a straight horizontal line from right to left. For two of them, their scribbles went down the line. The children wrote their names with correct spelling and letter formation, but the names were not in the appropriate place. 75% of them drew a transitional figure and only one produced a tadpole. All of these children did not draw the four shapes correctly.

11.11 % of children made scattered curved or continues scribbles. Some of the scribbles were vertical. Two of them wrote their names with correct spelling but missing some criteria. They drew a transitional figure and they could not copy the four shapes correct. The other two wrote their names as curved and round scribbles. One of them drew almost a transitional figure. The other drew a tadpole. They could not copy the four shapes correctly. The pencil marks on the paper was very light.

The rest of the children made scribbles on the paper. Two children drew shapes and inside the shapes they made shaded vertical lines or horizontal lines and some dots. One of them drew a conventional figure, and the other drew a transitional figure.

Both of them wrote their names with correct spelling, but missing other criteria. They could not copy both oblique shapes correctly.

23.40% of the preschool children did not write a letter. 18.18% wrote only their names with correct spelling in the middle of the paper. 9.1% drew a stick figure for his favourite person, and the other refused to draw. The children did not draw the four shapes correctly. Another 9.1% of children wrote their names using correct spelling except that the names were in the middle of the paper. The children drew a conventional figure, but one of them used sticks for the arms and the legs. They did not manage to copy any shape correctly. 36.36% of the children drew a transitional figure. 27.27% wrote their names with correct spelling and the fourth missed one letter, but the four left other criteria. All the 36.36% of children did not copy both oblique shapes correctly.

5.4.2.3.2 The typically developed children

This section describes some criteria of the typically developed children letter writing.

5.4.2.3.2.1 Audience

70% of the typically developed children wrote their letters to a direct and specific audience. All the children wrote their letter to either a mother or a father except two. One boy addressed his letter to his friend and other to her teacher. 34% of the letters had a beginning for their letters. For instance two children began their letter with (أبي العزيز - صديقي العزيز). A translation is: "dear dad" or "friend". Three girls began with أمي الحنون. - الغالية أمي -أمي حبيبتي. A translation is "beloved mum", "tender hearted mum" or "precious mum". Five children used (أمي- ما ما). A translation is "mum" or "mummy". Six children used (أبي- بابا). A translation is "Dad "and "Daddy".

Three children started their letters differently. For instance, tw0 children began their letters with their own names like (أنا زينب). A translation is: "I am Zaianab". The third child began with a word letter.

The rest of the children did not address their letters to a particular audience. The children wrote their letters as a statement. For instance, they used (أنا أحب أبي). A translation is: "I love my dad". One could say that the children who used dear

beloved precious, tender hearted, mum and dad were familiar with writing a letter. The other children might not be familiar or they did not write.

5.4.2.3.2.2 Purpose

All the letters of the typically developed children had a purpose. The most popular purpose was to express their love to either a mother or a father. 76% of the children wrote love letters. For instance, they said: "أنا أحبكي يا أمي أوأحبك يا أمي أو أبي احبك". A translation is "I love you mum".

4% of children expressed their love to a friend or a teacher. The other children wrote other expressive letters. 8% of the children wrote thanks letters to their mothers. One girl thanked her mother for raising her. She said: " شكرن لكي يا امي علا تدرسي ن معي". One boy thanked his mother for teaching him. One girl thanked her mother for helping her. One girl just wrote a general thanks with greeting.

6% of the children wrote a festival greeting letter. They sent Eid greeting letter. They used some of the terms that are popular among people in such occasions. One girl wrote a long greeting which is usually used in the T.V and greeting cards:

" عيدكم مبارك عساكم من عواد". She wrote very clearly with no spelling mistakes or erasing. It is possible that she learned it by sight through frequent exposure to it. One boy wrote an enquiry letter to his father. He asked him when he is coming back from his travel. He wrote: " أبي مت ترجعمن السفر ". A translation is "Dad when are you coming back?" One boy wrote an informative letter to his mother. He wrote: " بروح أزور جيراني". A translation is: "I will visit my neighbour". Two children wrote a request letter. One girl asked her mother to take her shopping. She wrote "السوق اليوم أمي خديني إلاخديني". One boy asked his father to take him to the park in order to play on the games. One boy indicated that he liked to do home work. He said:

" أنا أحب الواجب".

5.4.2.3.2.3 Ending the letter

All the typically developed children did not sign their letters except two girls. One girl wrote: "أنا أريج". A translation is: "*I am* ...". The other girl wrote: " هذه رسال حقي" . A translation is: "This is my letter".

5.4.2.3.2.4 Oral language

The typically developed children used their oral language in order to write their letters. This was clear from at least 22% of the letters. For instance, some children used in their letters some words which they use them in their every day social interaction. For instance "barooh" (بروح) is a verb for I am going. The child wrote the letter in the way he used it orally. Also, the girl who asked her mother to take her shopping, she wrote and spelled her letter the same way as she said or heard it used in her home context. The boy who asked his mother to bring him some toys used words "tejebeenlialaab"(تجيبلأعاب). He used one local word and attached it to another word in the same way he pronounced it. The child who asked his father about the timing of his return back from travel, he connected some words which are supposed to be written separate. 8% of the children used the markers as letters. For instance, in words like "shocran" "شكرن" which means thanks and "jeedin" " جدا" they used letter "n" instead of the marker. One girl connected three words together. She used something like "*because she raised me*" he wrote in this way "لي أنهربتني " instead of " لأنها ربتني ". Another boy wrote something *Dad you always take me to the games* " انتا كلا اتودينا الالعاب بابا ". He used his every day oral language in writing his letter. The girl who started her letter with a word letter "رسلة", she did not spelled it correctly. She wrote it in the same way she pronounced it without the long vowel.

5.4.2.3.2.5 Benefits of teaching

Arabic language is written with some markers on the top or the bottom of the letter. 28% (N=14) of the typically developed children wrote their letter using these markers. They used them in appropriate way. It indicates that they benefited from the teaching. The rest of the children did not use these markers in their letters. It is possible that they did not want to do that or at this stage their teachers had different priorities. Another thing is that the children used some Arabic words which can be used in school context only.

5.4.2.3.2.6 Structure

All the typically developed children began to write their letters from right to left on a straight horizontal line except a few children who went little to the bottom. They grouped letters together to form meaningful words. The words were spelled correctly except for the children who used their oral language. The size of the words was appropriate, except 6% of children wrote big words. The spacing between the words and within the words was appropriate for this age. In terms of words, 8% of the children used a sentence of two words only. 12% of the children used three words and 80 % of the children used more than three words. 66% of the children used one sentence in their letter and 34% of the children used two sentences.

The children had control on their hand movement. 6% of the children wrote their letters inside an envelope. It shows that the typically developed children were comfortable while they were writing their letters. It is possible that they were motivated to write a letter to their favourite person. They understood the part whole relationship. They used the space on the paper appropriately and had full control of their fine motor.

Table 5-3 Comparison between the typically developed children and learning with learning problems on construction of the letter to their favourite person

Feature	# of typically developed children	# of grade one children with learning problems	# of preschool children with learning
A child attempts to write a letter	All of the children had made an attempt to write	Only 44 children attempted to write a letter	Only 36children attempted to write a letter
The letter has an audience	35 of children directed their letters to a specific audience	Only 11 children directed their letters to a specific audience	Only 14 children directed their letters to a specific audience
The letter had a purpose	All children had a purpose in the letter. There are 4 different purposes	Only 10 children had a purpose in the letter. There 3 different purposes	Only 12 children had a purpose in the letter. There is only one purpose.
The structure of the letter	All children wrote from right to left on horizontal line. 33 children wrote one sentence. The rest wrote 2 sentences.	All children wrote from right to left on horizontal line. Most children wrote one sentence.	Most of the children wrote scribbles from right to left on horizontal line. Only 5 children wrote 2-4 words.
Benefit of teaching in the letter	Few children used markers, period and class words.	Few children used markers, period and class words.	_____
Use of oral language in the letter	They used oral language in their writing.	They used oral language in their writing.	_____
Signature at the end of the letter	48 children wrote their names as a signature at the end of the letter.	Only one child wrote his name as a signature in the end of the letter.	_____

Table 5-7 shows that the typically developed children wrote their letters better than the two groups of children with learning problems. The children's writings show that oral language is important in writing.

5.4.2.4 Example of children's work

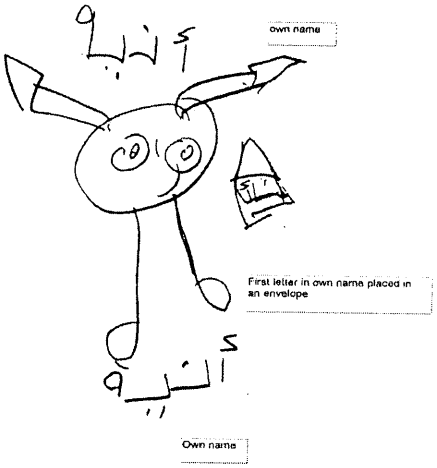
This part consists of two subparts. The first is on human drawing and writing. The second is on copying shapes.

5.4.2.4.1 Human drawing and writing

Figures 5-8 and 5-9 contain some of the children's work on writing during the interviews. Before discussing this work I expected that the children, who finished the preschool to write their first names correctly, and draw the human figure with main features. Also, I expected them to write at least one meaningful word in the letter. In

the case of grade 1 children, the first two elements are considered, but a meaningful sentence instead of a word is required.

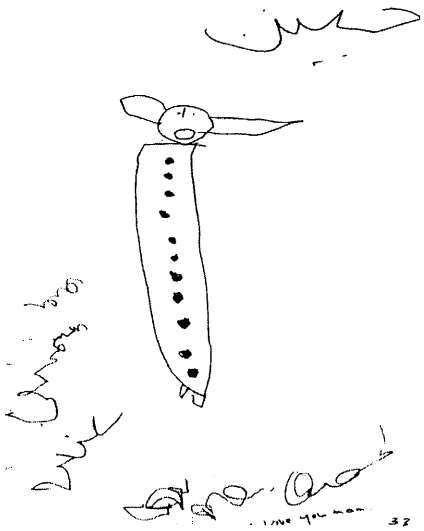
Figure 5-8 The work of some children with learning problems during the assessment of writing



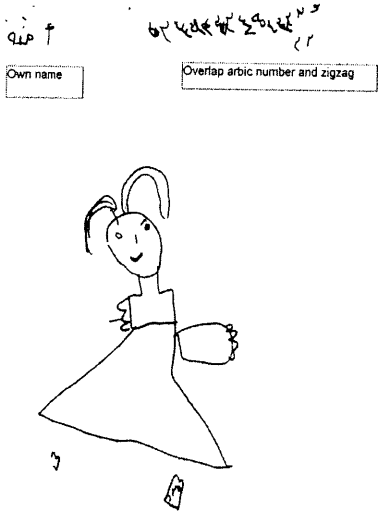
(1) Preschool girl



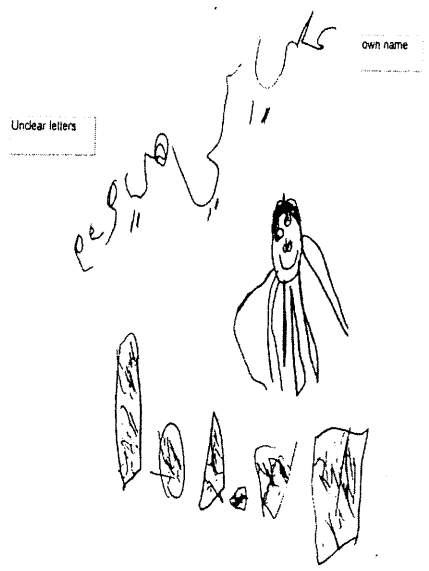
(2) Preschool girl



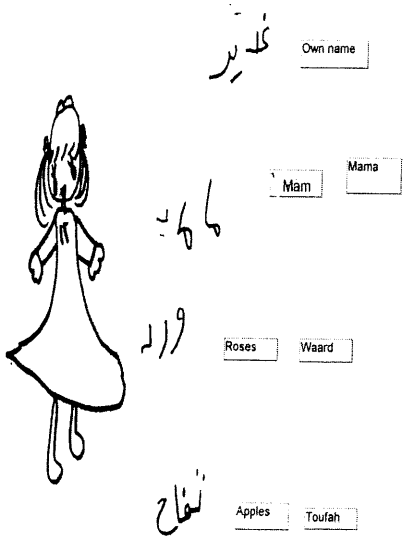
(3) Preschool girl



(4) Preschool boy



(5) Preschool boy



(6) Preschool girl

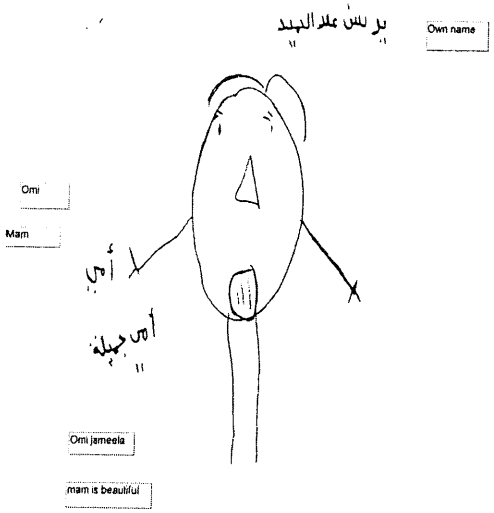
It shows that only four children (3, 4, 5, and 6) could write their first names correctly and clearly. Child (1) did not write her name, and child (2) wrote her name twice, but it is missing the second letter.

In relation to the human figure drawing, child (6) drew a complete figure of her mother with details. Actually, it is the best drawing in the preschool group. In their letters to their favourite person, the first child (1) drew an envelope, and she wrote the first letter of her name on it. Children (2 and 3) drew some curved lines, which might represent unclear symbols. Child (4) drew some vertical zigzag lines, which overlapped with some numbers. Child (5) drew some shapes with scribbles inside them. These shapes might represent some words, and the scribbles could be the letters. Child (6) was the only child in the group, who wrote three meaningful words. She wrote "*mama*" (mum), *"ward"* (flowers) and "*tufaah"* (apples). Children'swork shows a relationship among writing one's own name, meaningful words and drawing of a human figure.

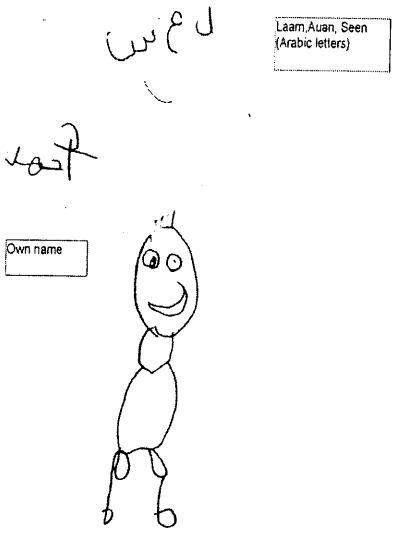
Figure 5-9 The work of some grade 1 children with learning problems during the assessment



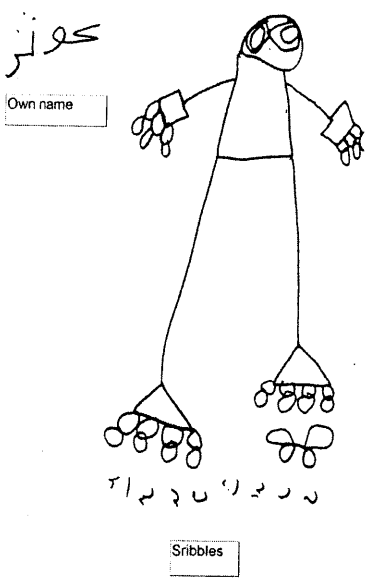
(1) Grade 1 girl



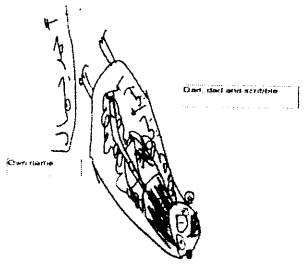
(2) Grade 1 boy



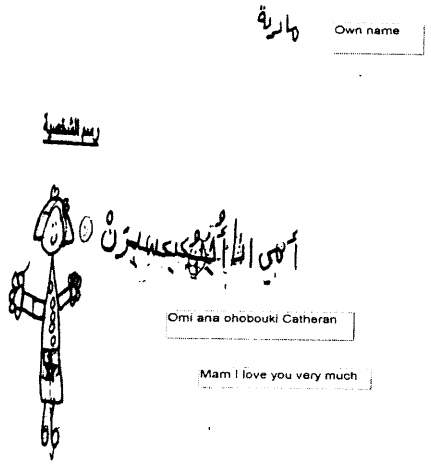
(3) Grade 1 boy



(4) Grade 1 girl



(5) Grade1 boy



(6) Grade 1 girl

In Figure 5-9, there are some drawings of grade 1 children with learning problems, whom were interviewed in the year 2006. The Figure shows that only four children 3, 4, 5, and 6 could write their first names correctly and clearly. Child 1 did not write her name, and child (2) wrote her name twice, but it is missing the second letter. Only child 2 and 6 wrote complete sentences.

Only two children, 5 and 6, drew their favourite persons' figures with complete features. The Figure shows that two children 2, and 6, wrote a letter to their mothers. The first child, 2, wrote a sentence of two words "*Umie jamela*" (mum is beautiful), and the other child wrote a sentence of four words "*Umie ana uhoboaci catheran*" (Mum I love you very much). Child 5 wrote on his father drawing a word "*abee*" (dad) twice and some scribbles. Deducing from that, children 1, 3, 4, and 5 need assistance.

5.4.2.4.2 Copying shapes

I discuss copying shapes of the children with learning problems and the typically developed children.

5.4.2.4.2.1 Children with learning problems

On copying shapes, some children with learning problems used "threading" in copying some shapes. Threading is to copy the shape without lifting the pencil. This

was in both clockwise and counter clockwise direction. I found 51.58% of the children with learning problems used threading in copying some shapes, as in table 5-8. These cases are without repetition.

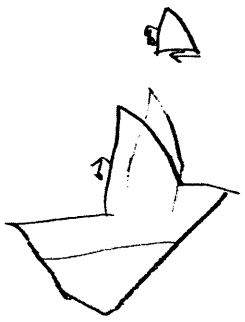
Table 5-4 "Threading" in copying the four shapes in the work of the children with learning Problems (n=95)

Tem	Threading/Clockwise	Thread/ counter clockwise	Total
all the four shapes	13	4	17
Square-triangle-diamond only	6	1	7
Circle-Triangle- diamond only	4	0	4
Triangle and diamond only	4	6	10
Square and diamond	1	0	1
Only triangle	4	0	4
Only diamond	3	3	6
No specific direction	-	-	46
Total	35	14	95

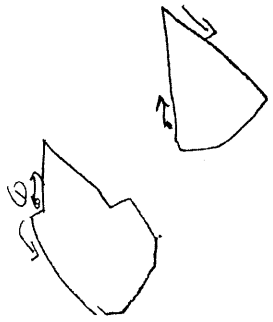
Using "threading" reflects that these children had appropriate grip of the pencil and flexibility in their fine motor skills. Actually it is an effective task focused strategy. I found only 12.63% of the children with learning problems copied the diamond correctly. Six of these children were under 7 years old (mean=69.67 months, 5.10 years) and the other six children were above 7 years old (mean=85.83 months, 7.2 years). Only two girls from the grade 1children drew the diamond shape correctly, and they used threading in the clockwise direction too. They were 74 and 75 months of age (mean=74.5 months, 6.4 years).

In copying the diamond shape, most of the children followed the same procedure which they used in copying a triangle shape. They began with copying an upper vertical acute angle first. Some of them started from the left side. They moved the pencil from bottom up, and then from this point down. This can be seen in preschool children 1 and 2 in Figure 5-10. Other children did the same, but this time they started from the right side as in child 3. A few children did not follow a certain procedure in their drawing of the diamond shape, as in child 5.

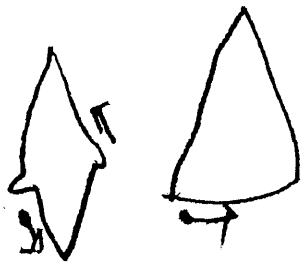
Figure 5-10 The procedure that some children with learning problems followed in copying a diamond Shapes



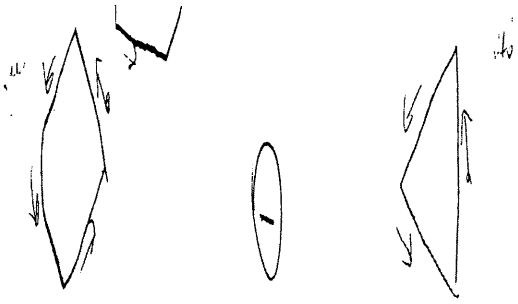
(1)Preschool boy



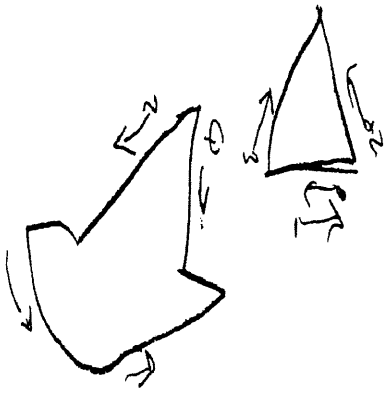
(2) Preschool boy



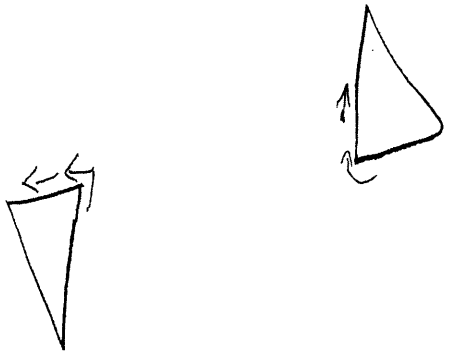
(3) Grade 1 girl



(4) Grade 1 boy



(5) Grade 1 boy

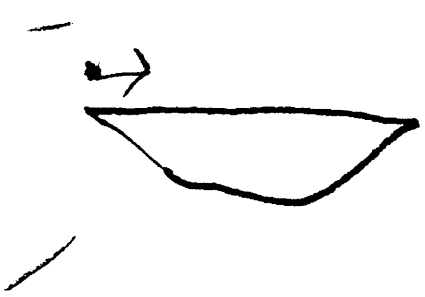


(6) Grade 1 girl

I observed that 86.3% of the children with learning problems could not copy the diamond correctly. The main difficulty was that these children could not draw the obtuse angles on the horizontal sides. The children who drew the diamond shape drew the bottom acute angle in the same way as the top acute angle. They started from the left end of this angle and moved the pencil down, and then up again on the other side in order to draw the bottom acute angle of the diamond shape. A different observation is that a girl from grade 1 drew a triangle with an upper vertical acute angle, and for the diamond she just drew the same triangle, but upside down in the bottom to the left of it as shown in child 6. I think that she imagined that the diamond shape was a continuation of the triangle shape which she drew earlier.

Figure 5-11 shows the drawings of the diamond shape in grade 1 children with learning problems age (6-8). I found at least six girls in grade 1 drew a conventional figure of their favourite's person. They wrote their names correct, and at least one sentence correctly. But they did not copy the diamond shape correctly (1, 3, 4, and 7).

Figure 5-11 Examples of copying a diamond shape in children with learning problems



(1) Grade 1 girl



(2) Grade 1 boy

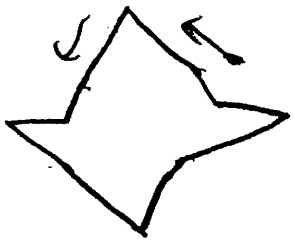




(3) Grade 1 girl



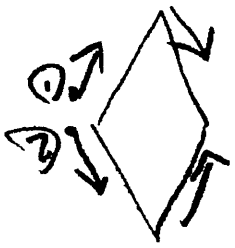
(4) Grade 1 girl



(5)Grade 1 girl



(6) Grade1 boy



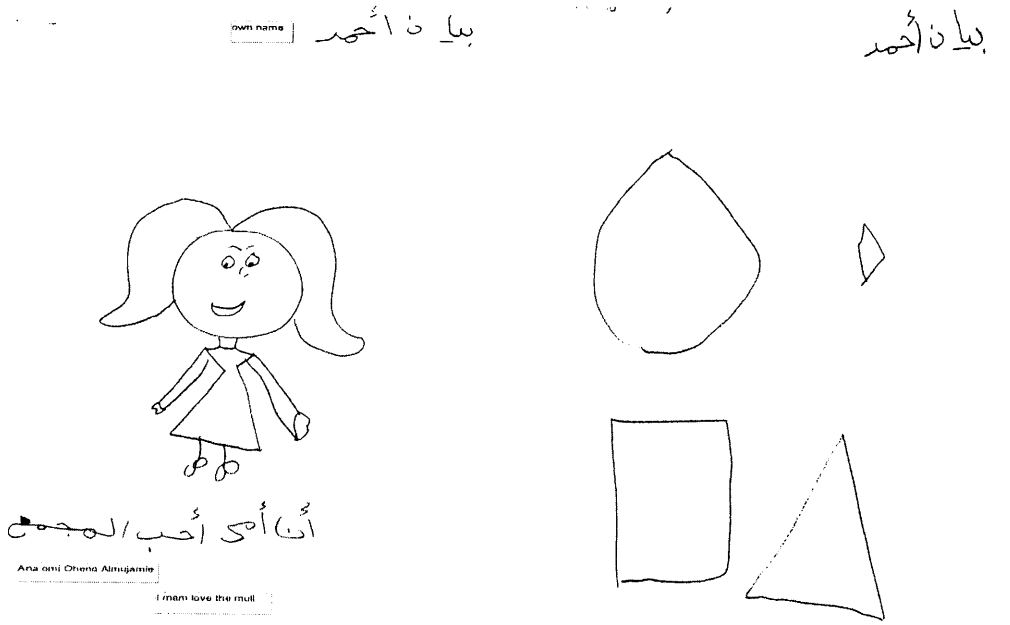
(7) Grade 1girl I

(8) Grade1 girl

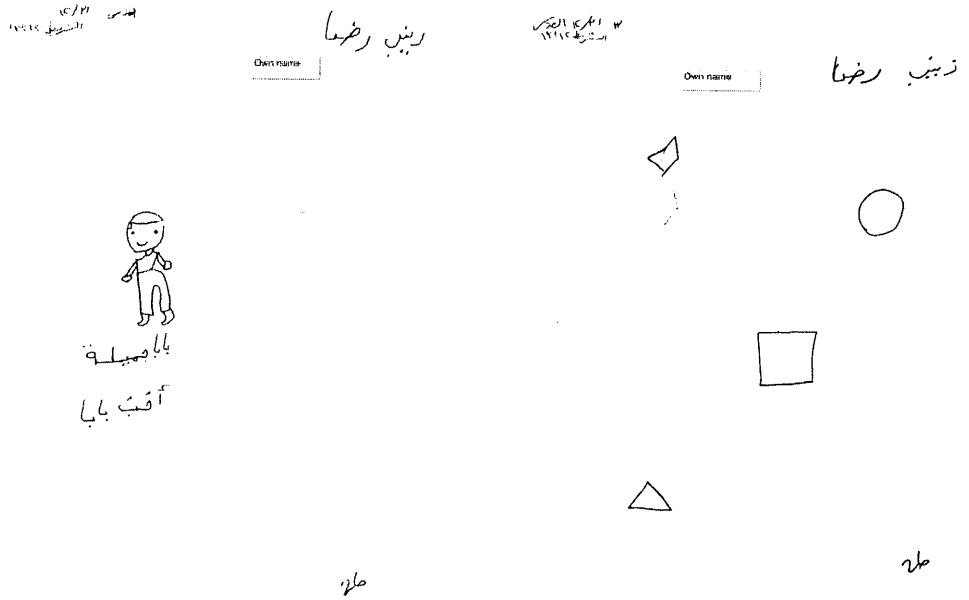
5.4.2.4.2.2 Typically developed children

All the typically developed children wrote their own names correctly and clearly. Their names were in a reasonable size too. They drew a conventional figure of their favourite persons with details, and they also wrote one to two meaningful sentences in their letters to their favourite persons. In copying the diamond shape, I found only 76% children who copied a clear diamond shape, and around 38% children, who could not copy the diamond shape well. These were 22% girls and the rest were boys. Two of them drew a completely different shape, which did not appear as a diamond at all. The rest of these children nearly draw a correct diamond shape, but their main problem was either in the obtuse angle(s), on the side(s) or the size of the lines in the shape. Figure 5-12 shows examples of such problems.

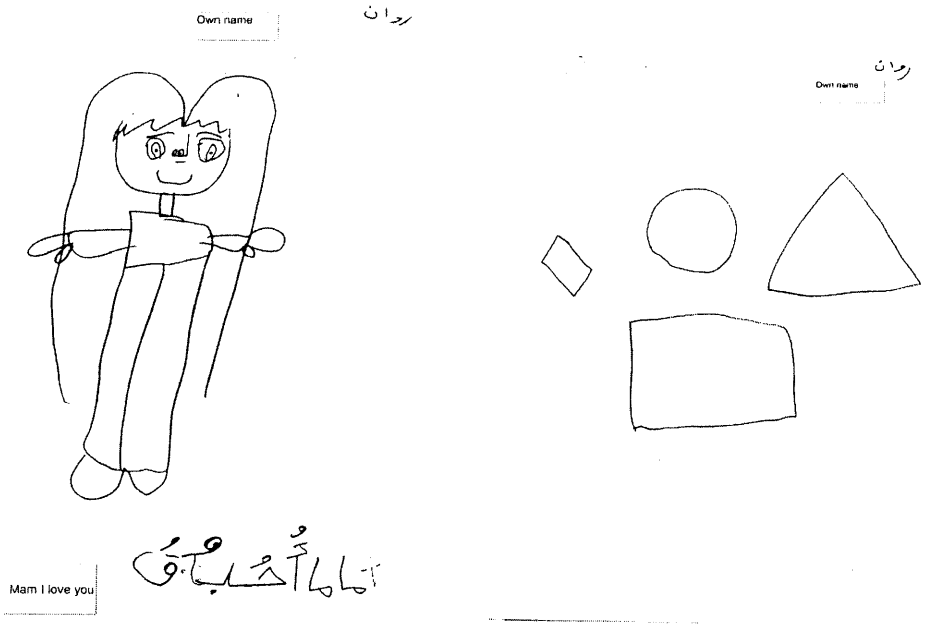
Figure 5-12 Examples of the typically developed children's difficulty in copying the diamond shapes



(1)Grade 1 girl



(2) Grade 1 girl



(3) Grade 1 girl

I think these observations show that development of copying the diamond shape does not necessarily accompany drawing of human figure, ones' own name and writing a text.

Table 5-5 Performance of the typically developed children on copying the diamond shapes across the Age range

Tem	Age	Number of children	Sex
Can copy a diamond	Age 84 months Mean = 84 months	2	Boys 1 Girls 1
	Age 72-82 months Mean = 77.71months	27	Boys 16 Girls 11
	Age 68-71 months Mean = 70 months	4	Boys 1 Girls 3
Cannot copy a diamond	Age 72-83 months Mean = 76.44 months	18	Boys 7 Girls 11
	Age 71 months Mean = 71months	1	Girls 1

In Table 5-9, 66% of the typically developed children (grade 1) copied the diamond correctly. Only 6.1% of these children were 7 years old, and the rest of the children were between 5.6 and 6.10 years old. At the same time, 38% of typically developed children who could not copy the diamond were between 5.11 - 6.11 years old. The results show that the number of boys who copied the diamond shape was higher than

the number of girls of the same age. It means that there are individual differences. In Bahrain age 7 years is not a norm for copying the diamond shape.

I investigated the procedure that the typically developed children followed in copying the four shapes in order to clarify these children's difficulties. Table 5.10 shows the procedure that the typically developed children followed in copying the four shapes, the circle, square, triangle and diamond.

Table 5-6 Hand movements in copying the four shapes in the work of the typically developed children (n=50)

Item	Threading/Clockwise	Thread/ counter clockwise	Total
all the four shapes	3	2	5
Circle-Triangle-diamond only	4	1	5
Square-triangle-diamond only	1	0	1
Triangle and diamond only	5	2	7
Square and diamond	1	0	1
Only triangle	6	5	11
only diamond	1	1	2
No specific direction	-	-	18
Total	21	11	50

In Table 5-10, most of the typically developed children used "threading" in copying most of the shapes. In the table, the number of typically developed children who used "threading" is mentioned without repetition. The results show that 64% of the typically developed children copied the shapes using "threading". 65.63% of the typically developed children drew the shapes in clockwise direction and 34.38% of children drew the shapes in counter clockwise direction. 27.59% children did not use a particular strategy in their copying. They started in one direction and lifted their pencil. Then, they started from another point in a different direction. These observations show that "threading" is the most advanced strategy in copying the shapes in general, and the diamond shape in particular. Bakeman, and Gottman, (1997) indicated that the children who use "threading" have well developed fine motor skills.

5.4.3 Early numeracy

The following are some comments on children's performances on the additive tasks in numeracy

5.4.3.1 Children with learning problems

In general, some children with learning problems used rhymes in their counting. Six children used this strategy continuously. I saw five children counted a visible collection only or they began to count it first. Some children especially in the preschool group placed their fingers on the screen to count. On the hidden task 8 + 5, one boy started with the first collection. He counted 5 on his right hand fingers. He began with his thumb. When he reached his index finger, he said "5". Then, he continued counting on the table 6, 7, and 8. Then, he counted on the other 5 on his left hand. He said "9, 10, 11, 12 and 13". In another incident, on the hidden task 5 + 4, and 9 + 6 two boys placed their both hands on the first screen. They tried to feel the counters, and count them .Then, they moved to the second screen, and counted on the rest. They did not reach the correct answer. On 9+6, and 7+5 tasks, some children counted them as 96 and 75. Five other children tried to remove the screen to count the counters. I observed that three girls from grade 1 used the "taught strategy". For instance, she said: "5 in my brain" and then counted on 6, 7, and 9 on her fingers.

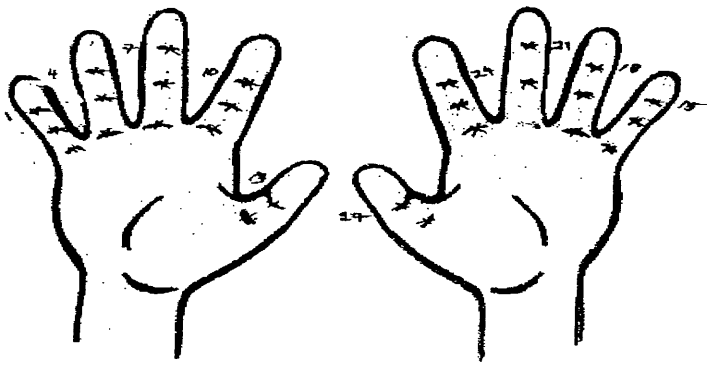
In summary, 86 of the children with learning problems were in stage 0 and 1 in their counting. They did not use a particular strategy in problem solving tasks. Only nine children were in stage 2 and 3. The first group started counting from 1, whereas the second group counted on from the end of the first collection.

5.4.3.2 Typically developed children

The typically developed children performed very well on the additive tasks. I observed that three of them showed signs beyond stage 3. Many of them used the previous mentioned taught strategy to count on and they reached the correct answer. Three children used the same strategy, but to countdown to. I observed three children who used their fingers in counting different from others. They used the horizontal lines in each finger in counting. They counted the thumb as 2, and each of the rest of

fingers as 3. For instance, in task 16-12, they counted the fingers in one hand as 14, and added 2 from a finger on the other hand in order to reach 16. Then, they took away the latter two as 16 and 15. Next, they took away another two from the thumb in the first hand as 14 and 13. Consequently, the answer was 4. See figure 5.13 for details.

Figure 5-13 Advanced use of fingers in children's counting in Bahrain



5.5 The children with learning problems performance on the test and on the school at the end of the year and their use of coping strategies

In this part, I investigate the relationship between the children with learning performance on both the test and the use of coping strategies. Table 5-11 contains the number of children who used coping strategies on various tasks during the assessment.

Table 5-7 The number of children with learning problem who used coping strategies or did not use coping strategies across the four areas of the test (n=95)

Area of learning problem	No of children with Learning problems who experienced difficulty on the test	No of children with learning problems and coping strategy	No of children with learning problem and no coping strategy
Phonological awareness (reading task 1-3)	75	9	68
Concepts of print	65	13	52
Drawing of human figure	78	15	63
Writing own name	18	2	16
Copying diamond shape	83	18	65
Writing a letter	54	23	31
Numeracy	92	29	63
The number of children with learning problems who used the coping strategy in the test with no repetition	465	60	35

The number of the children with learning problems who used the coping strategies with no repetition was 60 children. This figure constitutes 63.20% of the main sample (n=95). It is considered a large number. It is possible there is a link between academic achievement and coping strategies.

5.6 Results from interviews with adults

5.6.1 Class teachers and special education teachers

I interviewed class teachers twice once during phase 1(T1) and second during phase 3(T3). In phase 1, I enquired about children's use of negative coping strategies.

→ Read from memory

→ I want to go to the toilet,

→ Sit near a high achievement pupil to look at his work.

→ Raise his finger to answer all the questions

→ Fight with other children

I think the teachers saw some of these behaviours, but they did not pay attention to them or link them to pupils' work in the class. I think if I go back to them, I might be

given more reports of these behaviours because they will be looking for them. I could interpret that they did not link such behaviours with the child's learning problem. I recalled from my interviews with children that one girl in grade 1 told me she had a stomach ache. When I asked her class teacher about that, she mentioned that the girl does say this all the time.

During Phase 3 (T3) I talked to some teachers in both the primary schools and the kindergartens, whom I worked with. I discussed with some class teachers, senior teachers, and special education teachers, reading strategies that they used in their classes. I found that they used the holistic strategy in reading with grade 1. Usually, they begin with some sentences in a story. They divide each sentence into words, and each word into sounds. A few first grade teachers indicated that they use phonics. I noticed that they said the letter is a. They did not say: "the sound of the letter is a". This might clarify why some children were confused between the two terms. In contrast, in the kindergarten class, the focus is on the letter and sound relationship or on sounds of the letters only.

Special education teachers use the sounds of the letters in teaching the Arabic language. They think that using two different methods in reading at the same time creates confusion for the children with learning problems. It shows that the children learned the name of the letters either in the preschool or at home before they joined grade 1.

I asked class teachers if they used a special term for the front and the back of the book. They replied that they had not used these concepts with grade 1 children yet. I pointed at the front of the book, and I asked one class teacher, "What do you call this part of the book"? She said: " *Alkhelaf aalamami*". A translation is: the front cover of the book. The term which I used is: "*Mukhdemat alketab*". It might indicate that the children, who got the right answer learned these two terms either at home or the preschool. It is possible that a few children pointed at the front by chance.

During phase I asked about the five cases which I included in the discussions. I collected further information about them from teachers and the social workers in the school.

5.6.2 Other interviews with adults

These interviewes were conducted with school principals, social workers. The topic was about assessment policy and enquiry about some children. One school principal provided me with a copy of the Educational Evaluation System in Basic Education in the Kingdom of Bahrain which was published by the Department of Curriculum in the Ministry of Education in the Kingdom of Bahrain (appendix 2). All the participants replied that the policy of assessment says "no failure" in grade one. The school principals indicated that in some cases if a child is a very poor achiever in the class that a committee would be set up to make a decision. The committee would be formed from the school principal, class teacher, special education teacher and social worker. If the committee decided that the child should stay in the same grade, the principal calls the child's parent. She discusses the subject with the parent and the final decision is left to him. If he did not agree with the committee decision, he needs to sign a paper in order to take full responsibility. Some teachers indicated that they would agree to move a child to grade two if the child likes to learn. All the participants indicated that the school needs to take the decision. They mentioned that most parents do not want their children to repeat grade one. They added that the curriculum is very condensed and the number of children in a class is high (30 children). I found out that the class teachers use the competencies to identify the children who need support services.

Some class teachers told me that some of the children did not reach competencies, but they were listed under the children who reached competencies in the forms I received during phase 2(T2) from the schools. The reason was they moved to the next grade.

5.7 Summary

This chapter reported the qualitative analysis of the screening test which was used in this research. The main focus was on the coping strategies the children used during the assessment (academic tasks) and some children's performances in reading, writing and numeracy. The children used either "on task" or "avoidance" coping strategies. Older children used both coping strategies. In copying shapes, the Bahraini children learn to copy diamond earlier than 7 years. They used threading either clockwise or counter clockwise direction. The typically developed children counted using counting on strategies. Most of the children who did not do well on the test used coping strategies and they did not do well in the school too.

Most of the children with learning problems skipped a counter during counting. Reading is important for both writing and maths. The achievement of the older children on the test and school competencies was better than the younger children. Most of the children with learning problems did not have enough knowledge in literacy and numeracy.

6 Discussion

6.1 Introduction

In this chapter I discuss the findings of the present research. This chapter consists of six parts. The first part is on the test reliability, validity and the test implications. The second part is on reading and its implications. The third part is on writing and its implications. The fourth part is on numeracy and its implications. The fifth part is on the coping strategies the children used during the assessment and implications. The sixth part is on the children's achievements and the appropriate timing for assessing the children. The final part is on the limitations of the research.

6.2 Test

In Bahrain, an Arabic gold standard test is not available to identify young children's problems in literacy or numeracy. This research is an attempt to develop in Arabic a reliable and valid test to locate Bahraini children who are likely to have learning problems in reading, writing, and numeracy. This part is composed of two sub parts. The first subpart is on the reliability and validity of the test. The second subpart is on the implications of the test.

6.2.1 The reliability and validity of the test

The test is reliable and valid. For the test reliability, Cronbach Alpha was used. The highest value was 0.73 when 12 items of the test were selected and the sound of the letter was considered the correct answer instead of either the sound or the name of the letter. This value is above the satisfactory value which is 0.70 (Varma, 2005). This finding reflects the importance of phonics in teaching Arabic language.

For the validity, predictive, concurrent and construct validity were used. In the predictive validity, I used an additive risk model (Whitehurst & Fischel, 1994). I found that two or more areas of the test predict future reading problems in reading. The four areas were phonological awareness, concepts of print, writing and numeracy. The value of the sensitivity index was 93.3% and that for specificity was 66.6 %. The percentage of false positive cases where children had no problems and

the test identified them as having problems was high. In writing and numeracy two areas of the test or more also predicted future problems in writing and numeracy. The sensitivity was 87.5% which is above the satisfactory level; but the specificity was 66.3% which is less than 80%. The problematic level of specificity limits the utility of the test as a universal population-screening instrument, which could be administered to all children to predict subsequent problems in reading, writing and numeracy as the number of false positives would be unacceptably high. Boyle, Gillham and Smith (1996) had low specificity in their study. They indicated that, in this case, the test is more appropriate as a competence based diagnostic instrument, and may also be valuable as a confirmatory screening test, which can be used with suspected cases of having problems in literacy and numeracy. The test provides a profile of children's strengths and weaknesses in reading, writing and numeracy. Class teachers could use the profile to help children, whom they suspect to have learning problems. Application of the test as a diagnostic test could reduce false positive cases. It can be concluded that the test is reliable and valid.

The concurrent validity showed high agreement between the teacher evaluation of the children's performances in the class and the test results of the children ($r = 0.83$).

In the construct validity, the test was able to discriminate between the children with learning problems and the typically developed children on phonological awareness, concepts of print, writing one's own name, drawing a human figure, writing a letter and copying shapes.

6.2.2 Test implications

The confirmatory screening test which I developed in this research, to identify the learning problems of Bahraini young children in reading, writing and numeracy, is based on two underlying theories. For instance, the phonological awareness, concepts of prints, writing child's own name, drawing of human figure and copying shapes are based on developmental approaches. As children grow up, they learn those concepts. Social and cultural interaction is very important for the quality of learning. Writing a letter to a favourite person in the writing part of the test and the additive tasks in numeracy are based on the constrictive model of learning. The children construct

their own meaning of the concept internally. Using this test with young children in Bahrain requires an educational context which is appropriate with these two learning approaches.

In this section, I am going to discuss the framework of the educational context of Bahrain. I describe the behavioural approach as a main theoretical context in educating pupils. I explain some aspects of the objectives, the curriculum model and the assessment policy within the behavioural model in Bahrain.

6.2.2.1 Behavioural approach

In Bahrain, the primary educational context is based mainly on the behavioural approach. The behavioural approach emphasis is on the change in the observable behaviour. The approach focus is on the part of the pupil's experiences which could be seen or heard. The idea of the approach is to break down a complex task into smaller tasks, and teach each task separate. The approach helps the pupil to do tasks which contain sequential procedures only. In this approach, the interest is on the end product of learning which is not relevant to the pupil's experience in the task. The behavioural model pays attention to the quantity of education more than the quality of education. It is concerned with how many pupils pass, but it does not pay attention to the process of learning which the pupils use in their learning. These features of the approach do not agree with the broad goal of education, which is to prepare the pupils to live in the society (Kelly, 2004; Steele, 2005).

In 2001, The Kingdom of Bahrain selected democracy as an option. The behavioural approach does not provide pupils with freedom which is the main feature of the democratic system. Selection of the behavioural model in the educational context in Bahrain means that the decision is made in selection of the aims, curriculum model, teaching methods, and assessment procedures which fit in the behavioural approach.

6.2.2.2 Predetermined objectives

In Bahraini Primary Education, the system uses predetermined objectives called competencies. For instance, in reading, one of the main competencies in grade 1 is that pupil is able to read aloud around 10 sentences which are adequate to his level, accurately. The sub competencies are the following:

Pupil reads aloud with fluency, acquired sentences or words, and pay attention to:

- Pronunciation of words in the sentences correctly.
- Assimilation of meaning.
- Pupil reads aloud current learned sentences correctly using his previous experience.
- Pupil sings short rhymes correctly.

In the above competency it is predetermined that the pupil will be provided with some sentences on the boards, cards or a storybook and, through repetition, he is expected to read to the teacher at least 10 of these sentences. Reading aloud is an observable behaviour. The three sub competencies contain the words pronounce, read, and sing, which refer to observable behaviour; however, in the second sub competency, it is mentioned that the pupil assimilates meaning. This competency does not fit with the main objective because it is not observable. I think the way the first competency is constructed does not help the pupil to assimilate the meaning.

6.2.2.3 Curriculum model

The decision of using the competency-based objectives in the educational context in Bahrain limits the selection of the curriculum. The curriculum must fit with the behavioural approach in order to reach the goals. For instance, in the previous example of competency, the pupil might be provided with a particular story which contains a selection of sentences. The teacher's main focus is to teach these sentences only. She uses the teaching materials and sight-reading in order to help the pupil to read the sentences. The curriculum in this case is very limited, and it is concerned with a small part of the pupil's experience, which is reading aloud for a few sentences. The pupil is expected to repeat them frequently until he becomes familiar with them or memorizes them. I think this type of curriculum treats all the pupils the same. It is predetermined that all the pupils are average or typically developed children. It does not pay attention to the development of children or individual differences. It does not consider other learning which takes place in the mind of the pupils such as reading comprehension, imagination, and prediction. I think this curriculum model which is based on the behavioural approach neglects pupils with learning problems, and talented pupils. When I interviewed the head teachers, the

class teachers, and special education teachers, they suggested revision of the curriculum of the primary education. They complained that there is too much content, and memorization in the curriculum (Kelly, 2004).

In terms of the teacher and the pupil role in the class, it shows that the teacher is expected to transfer the knowledge which is provided in the content, in order to reach the predetermined objectives. She teaches the pupils in order to test them at the end of the period. She is limited in materials, and her style of teaching. She cannot modify the curriculum her teaching. Under the behavioural model, it is difficult to use her professional personal judgment on the spot to modify her plan for each pupil.

The pupils' role in the class is passive under the behavioural model of the curriculum. They receive knowledge ready from the teacher. They follow the teacher's instructions. They are expected to share the same meaning of concepts with the teacher and their peers. The pupils are forced to use just one style of learning which is not appropriate for all of them (Ulman, 1998).

6.2.2.4 Assessment procedure and assessment policy

Based on the behavioural model, the assessment must be appropriate for the objective, and the curriculum. For instance, in the previous competency, the pupil is expected to read at least 10 of the taught sentences. If he did that, it means he has reached competency. If he does not, he fails. The future plan is to go back, and teach him the same competency in the same way until he passes. This type of assessment is summative which does not provide details about the pupil's progress. It does not explain the positive areas in his attainment, and the areas which need attention in the future. It does not provide the parents with clear vision about their child's situation; also it does not give the teacher enough information in order to identify the pupil's problems, and to plan for his next curriculum using an appropriate style of learning.
The educational evaluation system of the basic education in the Kingdom of Bahrain (see appendix 1) contains some points which are the focus of the behavioural approach. These are the following:

- The evaluation system uses summative evaluation, and competencies.

- The learner level of achievement is estimated on a diagnostic scale of competencies.
- The evaluation has to be similar to what the learner will engage or function after graduation. It should be linked to the need of labour and service.
- The school and the teacher are responsible for the pupil's efficiency on the competencies.

I found other points which do not fit with the behavioural model. First, the evaluation system uses formative evaluation. This evaluation is used within the framework of the behavioural approach. It is used just to make sure that the pupil reaches mastery in the required competencies which is the end product. If he did not, the teacher needs to teach the pupil the competency which he finds difficult in order to test him again. The formative evaluation or assessment is not used to evaluate the entire experience of the pupil; it is still limited to the selected observable change in the behaviour.

Second, it says that the evaluation has to be in various real contexts, exciting, stimulating, could show learners' abilities and skills, emphasis self-concept and confidence. I think a learning experience is exciting, stimulating, and develop self concept, and confidence if it considers the pupil's interests, and provides them with choices, so they select what they like, discus the subject with others, and reflect on it. Is the behavioural approach going to develop such concepts in the pupil if it is limited to the observable behaviour, focuses on the end product, and the role of the pupil is a receiver of knowledge?

Third, the evaluation system indicates that the learner's performance must be holistic, clear, and practical. I agree with the clear and practical parts because the learning is observable, and in sequential procedure, but the learning is not holistic. It does not consider the learning which the pupil constructs in his mind.

Fourth, the evaluation system indicates that the evaluation should be developmental, extended to as a long period as possible; improve learners learning, teaching, and part of curriculum. I think the word development refers to the sequence of the competencies, and not the child development. I do not think the behavioural approach

provides the teacher a chance to improve the pupil's learning, teaching styles, and curriculum; because they are predetermined from the time the behavioural approach was selected in the educational context in the school.

Fifth, the evaluation system indicates that the evaluation should identify in advance skills such as problem solving, development of thinking, strategies such as the ability to draw conclusion and generalization. I think this claim, and other similar claims in the document are not relevant to the behavioural model. Problem solving and development of thinking take place when the pupil is free to interact with others, discuss, reflect and criticize. He could internally think, and construct his own meaning.

Sixth, in the evaluation system, it is mentioned that the teachers and the school should pay more attention to pupils with special needs. They must use various methods to raise their level of performance in as short a period as possible. These phrases indicate that the evaluation system perception of pupils learning problems is only within the scale of the competencies. I think this is one of the main reasons that the pupils with learning problems are not provided with appropriate support. It is possible that these pupils have problems with this type of learning, and there is a need to place them in another framework approach where we could have a broader idea of their attainment. In addition, we need to assess the child as a human being. We are required to consider his self-esteem.

The assessment policy indicates that there is no failure in grade 1. All pupils must be transferred to grade 2. In certain occasions, where the teacher thinks that the child must repeat grade 1, a committee is formed in the school, and the final decision is left to the guardian whether he wants his child to repeat grade 1 or to move to grade 2. A pupil with learning problems is allowed to repeat grade 2 and higher twice. Then, he is transferred to the next grade automatically. This policy stresses more on the importance of the quantity than the quality of education. The interest is to enrol more pupils in the school. The system gives a priority to the end product. It does not pay attention to the pupils' interests to be with their peers in the same grade. It does not consider the changes in the child development. Repeating the same grade and doing the competencies which they did not reach mastery in does not help the pupils with

special needs. In fact, it lowers their self-esteem, and develops a negative perception towards education. The result is more failure. Some of these pupils who fail experience tension, so they withdraw from the school as a coping strategy. Others use some coping strategies, and stay in the system for a longer period.

6.2.2.5 Summary

Looking at the theoretical basis of the confirmatory screening test which I developed to identify learning problems of young children in Bahrain, and the theoretical framework of the educational context in the school, it shows that the behavioural model which is used in Bahrain is not appropriate for the application of the test. I think this model underestimates the pupils' potential and might be the main cause for the pupils' learning problems in Bahrain. There is a need to adopt another theoretical model or combination of models which provides flexibility and choices. For instance, the constrictive model has broad principles, and allows use of different styles of learning. It recognizes the teacher's core role in education. It encourages her to understand, agree with the principles of education, and participate in the curriculum planning. This model provides the teacher with freedom to plan her lesson in a way that allows pupils to use their appropriate style of learning. They share their experiences with others, say their opinions, and criticize. The model allows the teacher to look at the experience of each pupil as unique, with prior judgment. Her interest is in the progress that the pupil is making regardless of the end product. She has the responsibility, and the freedom to make her own personal judgment during the pupil's experience. She could modify her aims, and future plans when it is appropriate, without constraints. The model allows collaboration between the pupil, and the teacher. The teacher scaffolds the pupil, and guides him in his learning. The pupil has an active role. Also, it encourages the pupil to work with others. This helps him to construct his own meaning of the concept or the task, and raise his self-esteem.

There is a need to use the developmental model. It is important to consider various aspects of development when we teach children, so that we do not need to push them to learn what they are not ready to do. It helps to understand that the children have

individual differences in development, understanding of knowledge, and style of learning. In addition, the behaviour approach could be used when it is needed.

An important implication is that the teacher does not focus on one area of difficulty when she studies the child's learning problem. For instance, if a child has a problem with reading the teacher needs to find out if the child has a problem in writing and numeracy too.

6.3 Reading

This section contains two parts. The first part is on the discussion of the phonological awareness findings and their implications. The second part is on the discussion of the concepts of print findings and its implications.

6.3.1 Phonological awareness

This part consists of three subparts. The first and the second subparts are on the importance of both phonological awareness and phonemic awareness for future reading in Arabic. The third subpart is on the implication of phonological awareness.

6.3.1.1 Phonological awareness

Phonological awareness is important for early reading accuracy in Arabic. Alumran and Alzera (2007), and Al mannai and Everatt (2005) reported similar results but with dyslexic children in Bahrain. They included 6 years old children in their study which was one of the groups in the present research. However, the first study did not mention the tasks which were used. The Al mannai and Everatt (2005) used non-word rhyming in their study. The finding in this research is also in line with Haddad and Gave (2008) results obtained studying Arabic bilinguals in Canada.

Furthermore, this finding is consistent with the studies in English (Bradley & Bryant, 1983; Bryant & Bradley, 1985; Wagner & Torgeson, 1987; Vellutino & Scanlon, 1987; Bryant et al., 1989; Blachman, 1984; Kirtley et al., 1989; Byrne & Fielding-Barnsley, 1991; Parrila et al., 2004; Boscardin et al., 2008). Kirtley et al (1989) used similar tasks.

6.3.1.2 Phonemic awareness

Phonemic awareness is important for future reading in Arabic in Bahrain. This finding is consistent with the results of Saiegh-Haddad (2007) and Saiegh-Haddad and Geva (2008) which were conducted in Arabic too. They used similar tasks, and the children were in primary school. The present finding is in line with the findings of Müller and Brady (2001) in Finnish; Høien et al (1995) in Norwegian. In the three studies, the orthographies were transparent, and the age of the children was similar to the age of the children in the present study. They also included identifying the initial phoneme in a word along side with other tasks in their tests. The present finding might reflect the advantage of the transparent script in the three languages which enhances reading in grade 1 very quickly.

Furthermore, the result of the importance of phonemic awareness in this research is in line with the research in other transparent orthographies such as Italian (Cossu, et al., 1988; Müller & Brady, 2001); Turkish (Oney & Durgunoglu, 1997); German (Wimmer & Hummer, 1990); and Welsh (Spencer & Hanley, 2003). In addition it is similar to some results in non-transparent orthography (Liberman, 1973; Bradley & Bryant, 1978; Lundberg et al., 1980; Stanovich, Cunningham, & Freeman, 1984b; Bryant, eta al., 1990; Muter & Taylor, 1998), and multilingual background English speaking children (Muter, 2001).

6.3.1.2.1 Phonemic awareness aspects in Arabic

There are three important aspects in this research. The first is the participating Bahraini children had either just enrolled in grade 1 or were at the end of grade 1 during the time of the assessment. In Bahrain, children as they enter grade 1 they receive explicit instruction in reading. As a result, their phonemic awareness increased. Research in non-transparent orthography (Bradely & Bryant, 1983; Kirtley et al, 1989; Treiman & Zukowski, 1991) found that explicit instruction in reading increases the children's phonemic awareness. The children enter school before they reach age 6. Other studies in transparent orthographies, where children enter primary school at age 6 and 7, such as Turkish children (Durgunoglu & Öney, 1999; Müller & Brady, 2001), and Norwegian children (Høien, et al., 1995) found that explicit

instruction in reading is associated with phonemic awareness. The important aspect is that the formal reading instruction in grade 1 regardless of the children's age. It is possible that the children who did not benefit from this instruction did not have enough social interaction with literacy before they entered school. They came to school with limited phonological awareness. Another possibility is that the teaching style, which is based on the behavioral approach, was not suitable for the children with learning problems. A third possibility, few children's personal characteristics, did not help them to interact with their teacher and peers in order to learn (Belsky & MacKinnon, 1994; Ladd & Burgess, 2001).

The second aspect is the transparency of Arabic orthography played an important role in the children's phonemic awareness. The children who benefited from reading instruction showed better phonemic awareness than others. This is clear from the scores of the typically developed children on phonological awareness. This aspect was found in other studies (Al mannai & Everatt, 2005; Saiegh-Haddad, 2007; Müller & Brady, 2001; Cossu, et al., 1981; Durgunoglu & Oney, 1999; Holopainen, et al., 2001 in Aro, 2004).

The third aspect is that Arabic consonant vowel (CV) is the unit, and vowel consonant (VC) is not regular in Arabic. It implies that more demand is on phonemic awareness. Poor scoring of the preschool and the grade 1 children in the group of children with learning problems, and few typically developed children on identifying the shared sound at the end of two words, provides evidence that rime–cohesion hypothesis (Treiman, 1983, 1985; Goswami, 1986, 1989) is not applicable in Arabic language. It explains that CV in Arabic is more important than VC, as in English. This finding confirmed the results of Saiegh-Haddad (2007) with Arabic, Palestinian children. The children with learning problems had also some difficulties with identifying the shared phoneme or sound in the beginning of two words. This might explain the cohesion of CV in Arabic which makes it difficult for the children with less phonological awareness, and limited experience with Arabic orthography. Frequent exposure to Arabic orthography might increase the children's awareness of the intra components of CV. In addition, the children might be confused between the dialect, and the classical Arabic which is used mainly in reading text, and writing.

Even in Arabic lessons, the teacher does not use classical Arabic in her conversation with the children. The children need more time to adjust, and understand the two versions.

6.3.1.3 Implications for phonological awareness

6.3.1.3.1 Assessment

According to the finding in this research, the assessment of Bahraini children at risk of having reading problems in Arabic should include the phonological awareness and phonemic awareness tasks used in this research. These are identifying the initial phoneme or sound in a word, identifying the shared phoneme or sound in the beginning of two words and identifying the shared sound at the end of two words. It is suggested that pictures are used in the test.

6.3.1.3.2 Curriculum

A module on phonological awareness as a part of the preschool curriculum is important for all children. In grade 1 curriculum, a module on phonemic awareness is important. The instruction needs to be explicit, intense, and more motivated especially for the children who were diagnosed at risk of having reading problems. It is suggested that the curricula are structured within the constrictive approach which motivates the children to learn, and reach their own conclusions. At the same time it raises their self-esteem to learn, and reach their own conclusion. Both preschool and grade 1 children need enough interaction with print.

6.3.1.3.3 Teaching and teachers

It is important that teachers provide children in preschool (5- 6 years) explicit instruction in phonological awareness. In grade 1 (6-7), the children are provided with explicit instruction in phonemic awareness. It is beneficial in both levels if the instruction is frequent, and the class environment is full of print.

6.3.1.3.4 Intervention

This section consists of two parts. The first part is on teacher training as an intervention. The second part is early intervention for children.

6.3.1.3.4.1 Teacher training

Teacher training is required to include two important aspects. The first aspect is to introduce knowledge about children's literature. The teachers are required to have enough knowledge about children's books. They should be aware of some titles of current books for children. Such knowledge helps them provide the children with an appropriate literate environment in the class. The second aspect is to include the knowledge of the structure of Arabic language such as phonology, orthography, morphology, and text structure. At preschool level, the focus of the training needs to be on the knowledge of phonological awareness. At primary level, the focus of the training is required to be on phonemic awareness. Such training helps class teachers in teaching reading for children in kindergarten and primary school. The special education teachers also, need similar training (McCutchen, Harry, Cunningham, Cox, Sidman, & Covill, 2002). Troyer and Yopp (1990) found that less than one third of the teachers in their study knew the term phonological awareness.

Moats (1994) interviewed teachers, and they found that less than 20% of them provide correct answers on English phonology and orthography (McCutchen, Harry, Cunningham, Cox, Sidman, & Covill, 2002). McCutchen et al (2002b) found that increasing teachers' awareness in language knowledge is very important in the intervention program on phonological awareness. They found that the preschool children that had trained teachers on phonological awareness, and orthography made more progress in orthography than the control group whose teacher had no training. The grade 1 children who had teachers with the same training performed better than the control group.

6.3.1.3.4.2 Early intervention

This section consists of four parts. The first part is on the importance of an early intervention program in reading. The second part is on some research which used intervention programs in phonological awareness for preschool and primary levels. The third part includes some studies on intervention programs which make emphasis on phonemic awareness for both preschool and primary grade. The fourth part

discusses a selection of appropriate intervention programs for the children with reading problems in the present research.

6.3.1.3.4.2.1 Importance of early intervention program

Early intervention is important. Satz and Fletcher (1988) proposed that intervention has a more positive effect if it is provided to children before identifying their learning, rather than later. However, children who received intervention later showed limited improvement on an academic level. Other studies (DeHirsh, Jansky, & Langford, 1966; Strag, 1972; Schenck, Fitzimmons, Bullard, Taylor, & Satz, 1980) showed that the children who were identified to have reading problems at an older age might not struggle if they received reading intervention at an early stage (Chard & Dickson, 1999).

6.3.1.3.4.2.2 Intervention program on phonological awareness

There are a lot of intervention programs on phonological awareness. Some longitudinal interventional studies found that phonological awareness in kindergarten and grade 1 have positive effects on acquisition of reading (Bradley & Bryant 1983; Brennan & Ireson 1997; Lie 1991; Lundberg, Frost & Petersen 1988; Schneider, Küspert, Roth, Visé & Marx 1997). Lundberg et al (1988) conducted an 8 months training program for Dutch preschool children. The program contained games, nursery rhymes, and rhymes stories. They found improvement in the children's phonemic segmentation skills in comparison to other children who did not have such training. They indicated that the program had a positive effect on the children's reading, and spelling in grade 2.

Torgeson, Morgan and Davis (1992) found that the children who were enrolled in an intervention program, which is composed of both blending, and segmenting skills, had better results on phonological awareness tasks than the children who had only blending training or other language experience which did not include phonological awareness (Nancollis, Lawrie & Dodd, 2005). The importance in these two skills lies in their close relationship to reading, and spelling of words. The teachers need to introduce blending, and segmentation skills to children. At the preschool level, the activities begin with blending or decoding syllables and onset and rime into words.

Then, they move to segmenting. They begin with counting the number of syllables in a word and number of words in a sentence. Later, they segment words into onset and rime. In these activities the teacher could use toys, cards and books, available in the classroom (Pullen & Justice, 2003).

Hines (2009) suggested using onset-rime instruction for children who begin to read, those at risk of having reading problems or have profound reading problems. She argued that it is easier for a child to separate the onset from the rime in a word than to divide the onset or the rime into smaller units the phonemes. She added that Anthony, Loniagan, Driscoll, Phillips and Burgess (2003) indicated that by nature, the children could hear the onset and rime in the speech. Juel and Minden-Cupp (2000) mentioned that segmenting the phonemes in words is hard for children because the phonemes merge in the words, and it is difficult to identify each phoneme when we listen to people talk (Hines, 2009).

Hines (2009) added that the grapheme phoneme relationship is usually complex and irregular. The vowel could change depending on the final constant. She reported (Treiman, Mullinnex, Bijeljac-Babic, & Richmond-Welty, 1995; Carroll, Davies, & Richman, 1971) that the English phoneme has more consistency and stability in pronunciation than the vowel grapheme or first consonant and vowel. She mentioned that onset-rime analogy does not include a short vowel which creates confusion. This analogy is in line with the progressive development of phonological awareness from a larger fragment to smaller units (Adams 1990; Goswami, 1993; Stahl & Murray, 1994; Anthony, Lonigan, Driscoll, Philips, & Bergess, 2003). Some researchers (Christenson & Bowey, 2005; Haskell et al., 1992; Walton & Walton, 2002) found that grapheme–phoneme and onset-rime–level are better than whole-word instruction for normal children who begin to read. Hines mentioned that other researchers indicated that onset/rime is useful for children at risk of reading problems (Levy & Lysynchuk, 1997; Walton, Walton, & Felton, 2001; Savage et al., 2003). However, Ehri (1998) suggested that grapheme-phoneme is important for success of onset/rime program (Hines, 2009).

6.3.1.3.4.2.3 Early intervention on phonemic awareness

There are some effective intervention programs which focus on phonemic awareness. For instance, Byrne and Fielding-Barnsley (1991b) provided preschool children (aged 55 months) an intervention program called Sound Foundations for 12 weeks. The experimental group was taught six phonemes in the initial and final position of words. Then, the children were asked to focus on the sound, and it was demonstrated to them how to pronounce the sound. The children need to say the rhyme with the phoneme in the appropriate position. Then, they asked the children to find some objects on the provided poster that have the phoneme either in the front or the end of the words. Next, the children coloured the object which contains the letter of the phoneme on their worksheets. On the other stage of the program the children had two card games. The children need to match objects based on their initial or final phoneme. The control group had storybook reading and a semantic categorization program. Some improvement was observed in grade 1 and 2 (Whitehurst & Lonigan, 1998).

Clay (1979) found in her study of 6 years old children that the reason some children did not make progress in phonemic skills is that they did not hear the sound sequence in the words. Based on this result, she used phonemic awareness training program for Elkonin (1973). Shankweiler and Fowler (2004) found that phonemic awareness is the keystone for reading. They advised to consider explicit and systematic training in phonemic awareness.

Hatcher, Hulme, and Ellis (1995) and Iversen and Tunmer (1993) found that the emphasis on both phonemic awareness and print awareness is effective in the training of children. Other studies found that phonemic awareness training has a positive effect on the development of reading in children at risk of having reading difficulties (Blachman 1994; Olofsson, Lundberg, Frost & Petersen 1991;; Hurford, Schauf, Bunce, Blaich & Moore 1994; Lundberg 1994; Borstroem & Elbro 1997).

Stuart and Connel (2008) worked with children whose age was in the range of 4.3-5.2 years (N=128). They found that the instruction on phonological awareness which

makes more emphasis on phoneme segmentation, and blending is better than the one that focuses on rhyme, vocabulary or letter sound relationship. Ehri et al. (2001) found that the instruction on phonemic awareness improved children's phonemic awareness, word reading and spelling skills. They indicated that teaching one to two phonemic skills with letters is the best (Lerkkan, Rasku-Puttonen, Aunola, & Nurmi, 2004).

Phonological awareness intervention based on phoneme manipulation skills was found to be very effective for children with reading problems (Gillon, 2000; Gillon & Dodd, 1995; Stuart, 1999 in Nancollis, Lawrie & Dodd, 2005). Lewkowicz (1980) found that phoneme segmentation and blending are both important for reading. In segmentation, a teacher acts as a model. She says a word very slowly, and pronounces each phoneme very clearly without stopping. Then, she asks the children to take a turn. They do that in pairs or in a small group through play. The teacher may ask the children to organise themselves, and create their preference in doing the task. She could provide them with some materials such as puppets, counters, coloured papers and stars. In blending, she starts with small and familiar words. For instance, she could include two to three phoneme words.

Hatcher, Hume and Snowling (2004) conducted a longitudinal interventional research. They investigated the effect of three programs on children's reading. The children were typically developed and at risk of reading problems. They were from prekindergarten and kindergarten. The sample size was 410 children and the children's age was in the range of 4 - 4.5 years. The children were split into four groups, control who had reading only, and experimental who had reading with rhyme, reading with phoneme, and rhyme and phoneme with reading. They found that the typically developed children had sufficient phonological awareness, and they did not need additional training in phonological awareness. They added that the children at risk of reading delay needed additional training in phonemic awareness which is associated with letters.

6.3.1.3.4.2.4 Early intervention in Arabic language in Bahrain context

There are few points need to be consider in oder to select an appropriate intervention program for Bahraini young children who are at risk of having reading problems or had reading problems in this research.. First, the children who were at risk of having reading problems were in preschool and grade 1. Second, Arabic orthography is transparent which means grapheme-phoneme is very important. Linking these points with the above knowledge on intervention, it is more appropriate to use a phonological awareness intervention program for the preschool children who are at risk of having reading problems or delay. It is beneficial that this program is provided in a meaningful manner with an environment full of print.

For the primary school children who had formal instruction in reading, it is more appropriate to provide them with an explicit intervention program, which focuses on phonemic awareness (e.g. blending and segmenting of phonemes) and interaction with print.

6.3.2 Concepts of print

The four items identifying the back and the front parts of the storybook, identifying some letters, and words in the storybook showed that concepts of print are important for reading success in Arabic. This finding is consistent with other studies (Clay, 1985; Lovelace & Stewart, 2007; Lomax & McGee, 1987; Mason,1980; Scarboraugh,1998; Whitehurst, 2002; Hammill, 2004; Tunmer, et al., 1988; Day et al., 1981, Johns, 1980, 1982; Nichols et al., 2004; Snow et al., 1998; Mason & Kerr, 1992; Justice et al., 2006; Hardy et al., 1974; Mason, 1984; National Panel of Reading, 2000; Yopp & Yopp, 2000). The findings from this research confirmed the previous results which indicated that children enter grade 1 with limited knowledge of concepts of print (Day, Day, Spicola, & Griffin, 1981). In fact, it adds some information that children enter grade 2, and they lack these technical terminologies about print. The instrument of concepts of print is useful in identifying the children at risk of reading problems in the future. It was able to differentiate the children with learning problems in reading from the typically developed children. It is similar to

the finding of Justice, Bowles and Skibbe (2006) in which they were able to identify the preschool children at risk of having reading problems in the future.

In this research, most of the children with learning problems who performed very poorly were from the preschool. In Bahrain, the preschool curriculum is not constructed on a scientific basis, and most of the teachers are not qualified. Most of them are high school graduates. Some of them might have in-service training. The grade 1 curriculum doesn't include concepts of print. The teachers definitely know the terms, but they are not aware of how important these special terminologies of print are for successful reading. Therefore, they do not introduce them to children. As a result of this, the children at preschool and grade 1 were not provided with an appropriate print environment to enhance their awareness of print. The teachers do not read stories with children or they do not even encourage parents to read some stories with their children. Some children might hold the book in appropriate way, begin to read at the top right hand side, and follow the text from right to left, but they do not have the knowledge, and the appropriate terms. Most of the children, especially those with learning problems, do not interact with print in their home context. The parents might not be aware of the importance of their role in children reading achievement, so they do not read stories with them.

In the results, the children had more difficulties in identifying the back part of the storybook than the other items, but I could not find the confidence interval for the correlation in order to find the size of the effect. Most of the studies that I am aware of did not mention details about the items of the print which were used, except the studies of Lovelace and Stewart, (2007); Sultmann et al., (1983) Day, et al., (1981). However, only Lovelace and Stewart, (2007) included the back part of the book in the test.

There is more than one interpretation for the children's difficulties on identifying the back part of the storybook. First, class teacher uses both Bahraini dialect and classic Arabic with children. In Bahrain there are two dialects. This means that there is more than one term for both front and back in Arabic. For instance, a word front has at least three terms "amam"(أمام), "gedam"(قدام), and "mukadimat"(مقدمة), and a word back has at least three terms "dahr" (ظهر), "khalf"(خلف) , and "akher"(اخر). These

terms are used in different contexts. In the test, I used the word "mukadimat alketab"(مقدمة الكتاب) for the front of the storybook. This term is appropriate for the book. For the back, I used "dahar Alketab (ظهر الكتاب).

The children in this research were young. They had limited experiences, and vocabulary. It is possible that the children were confused with which term is to be used in the context of print. For instance, they are more familiar with the word dahr when it is used as a body part. This confusion was observed in few typically developed children who did very well on all items except on these two items. It is possible that the children who pointed at the front or the back did that by chance. It is important to take identifying the back of the book as the most discriminating item between the two groups with caution. It needs further investigation. In the implication, it is better to consider all the items in the concepts of print which are appropriate for this age group because the children do not need only one item in order to learn reading with success.

6.3.2.1 Implication for concept of print

6.3.2.1.1 Assessment

The teachers (preschool and grade 1) could use the informal tool of concepts of print, which is developed in this research, as a guide to assess the children. They might add some items for older children if they think it is required. They can observe the child's reading, ask him some questions, and make some comments. They can identify the concepts they know and the ones they do not know. Based on this, they can construct explicit instruction on the concepts of print.

6.3.2.1.2 Curriculum

The school curriculum is required to provide children with a thorough print environment. It includes storybooks, scientific books, lists (such as shopping list, menus and letters), and cards which contain alphabet and words. It is beneficial to include the books with the characters the children like.

6.3.2.1.3 Teaching and teacher

Class teachers need to provide children with explicit instruction on concepts of print. It is important that the class teachers bear in mind that a lack of concepts of print could be a reason for the pupils' difficulties in reading. They need to observe the pupils during reading, and provide the ones that have difficulties with such concepts, additional intensive explicit instruction, and activities. The teachers should be aware of the technical terms which they use in the class, and investigate if the pupils find them confusing. They could do that by listing the terms which they use in the class. Recording some of their lessons could help them to collect some words which they use, but which do not make sense to the pupils. Sometimes, the teachers take for granted that the terms are very easy for the pupils. However, they are not for some pupils. For instance, they must be sure that the pupils understand the meaning of a sound, a name of a letter, a letter, a word, front, and back of the book.

6.3.2.1.4 Intervention

6.3.2.1.4.1 Role play (preschool)

Children could use art craft during interaction in play and drama (Neuman & Roskos, 1990; 1992). For instance, if the topic is on healthy food, they can draw a can of milk, bread, some fruits, and vegetables. Then, they use cards and pens to label each item. At home, the child could sit with his parents, and write a shopping list before they go to a supermarket. At the supermarket, the parent asks the child to look at the list and bring each item from the shelf. The child will focus on the logo and may be the word on the item and he picks it up. Such activities motivate the children a lot, and enhance their awareness of the print (Christie & Enz, 1992; Neuman & Roskos, 1993; Pullen & Justice; 2003).

6.3.2.1.4.2 Parent - child shared storybook reading (preschool and primary)

Parent child shared storybook reading is important to develop the child's awareness of the concepts of print, environmental print, and alphabet knowledge. The preschool and the primary school need to provide parents with some sessions to draw their attention to their role in their children's reading. The schools need to explain to

parents how to select an appropriate storybook, and at the same time which books their children like to read. They need to select the time that the child is willing to read a story. They teach them how to interact with the children while reading a storybook. The schools teach the parents how to make reading time very fruitful.

Usually parents act as a role model for their children. When a mother sits with her child, he observes her, and copies her behavior. He learns to hold the storybook in an appropriate way, and turn the pages. He tries to put his tiny finger on the page to follow the line. During the story time the mother uses explicit instruction on print convention. The mother may ask the child some questions (such as where is the front of the book, where is the story, show me a letter or a particular letter, words, and show me the space between words). She waits for a while to give him a time to think. She encourages him to say his comments, and be attentive to the print. She may ask him to point at some words. Justice and Ezell (2002) observed young children aged 3-5 years in a reading program (Head Start) which lasted for 8 weeks. They found that print referencing strategies (such as talking about print, asking the child for comments) have strong impact on the child awareness of the print. In a 4 week program, Justice and Ezell (2000) found that the young children, whose parents were trained to use explicit print referencing, showed more improvement on concepts of print than the children whose parents did not use such strategies (Justice & Ezell, 2000). A similar finding was reported in children with communication disorders whose parents were enrolled in the 5 weeks intervention program (Ezell, Justice, & Parsons, 2000). It is suggested that both teachers and parents use explicit print referencing strategies when they share story reading with children.

6.4 Writing

The results show that a child writing his own name, drawing a human figure, coping oblique, writing a letter to a favourite person are important for writing in Arabic language. However, copying the diamond shape was the most discriminating item between the typically developed children and the children with learning problems. This section is on the children's work in these four items and the possible implications.

6.4.1 Four items of writing

This part discuss the findings on the four items of writings: writing one's own name, drawing of a human figure, writing a personal letter, and copying shapes.

6.4.1.1 Writing one's own name

Children begin to treat their first names as special objects (Hoorens et al, 1990). In this case, they make an internal model of the name like human drawing (Luquet, 1927, 2001; Inhelder and Piaget, 1958; Arnheim, 1974; Freeman, 1975; 1980). As the children grow they use the process of construction of the name, and they become aware of the rules which govern writing the name. They comprehend that these rules are different from the rules of drawing. It is possible that they start this stage when the route of writing in the brain is distinguished from the route of drawing (Adi-Japha & Freeman, 2001).

Looking at the three groups of children's performances on writing their own names, it appears that the grade 1 children were exposed to their full name in the school context. The preschool children were exposed to their first name only at home or preschool. If we consider the assumption of the internal model, the typically developed children had a complete internal model of their full names. It seems that they were exposed to their names, and wrote their full names on regular basis in the school. They had ready plans of how to write their names on a paper from their previous experiences. They were able to retrieve all the letters in sequence while writing their names. They had appropriate fine motor skills which helped them to write the retrieved letters fast and in sequence. This was clear from using threading in copying the shapes. They used the space on the paper effectively. They placed the letters in a sequential cluster. They had a clear idea that letters are arranged in a linear string cluster. At this stage, they knew that the name is governed by the rules of writing, and it is not any more a drawing. It is possible that the typically developed children were motivated, and trained to write their names in the class.

The grade 1 children with learning problems were in the same context as the typically developed children in the school. It appears that this group of children had an internal model of their full names. Most of the children wrote only their first name. It is

possible that they did not want to do further writing. Another possibility is that the teacher did not ask them to write their full names frequently. It appears that motivation was an important aspect for this group of children. The children who wrote their names in large letters, and left uneven spacing might have a spatial ordering problem. They had difficulties in organizing their writing on the paper. The children who left a letter or a dot twice might not be attentive to the task. It is possible they were not corrected in the class. A third possibility is they had fine motor coordination problem. They spent a long time in formation of some letters. During this time they might forget what they retrieved from the memory. They need more practice in writing their names.

I think the preschool children did not have enough guidance on where, and how, to write their names. Usually, in the preschool, the teacher writes the name of the child on his work. It is possible that they did not have enough activities such as playing with dough, cutting paper with a pair of scissors or painting, and drawing. Such activities help the children to gain flexibility in the small muscles of their fingers, and appropriate pencil grip.

The preschool girl 2 who did just scribbles in Figure 5.8 did the same in writing a letter. In the drawing of the human figure, she just drew one small circle for the head with two smaller circles for the eyes and one large oval shape for the rest of the body attached to the head. The pencil marks on the paper were very light. The pressing force of the pencil on the paper was not enough. This girl was sitting in a wheel chair. She experienced difficulty in talking, and overall body features were not normal. I found out that she has learning difficulties. It is possible that she had difficulties in planning to write her name, spatial ordering on a paper, and fine motor coordination.

The age of the children who participated in the research was 6 years and above. This means that they are supposed to write at least their first names in the same way as the typically developed children did. In this research, it shows that low scoring on writing one's own name discriminated the children with learning problems from the typically developed children in writing. The finding of the importance of writing one's own name in Arabic writing is consistent with other findings such as

Bloodgood, 1999; Behnken and Haney (2001); Dunsmuiri and Blatchford (2004); Aram & Biron, 2004; Molfese, et al (2006) and Cabell, et al (2009).

6.4.1.2 Drawing of human figure

During the assessment, both the typically developed children and the grade 1 children with learning problems were 7 years old and above. The preschool children with learning problems were 6 years. Usually, children at this age are able to draw a simple conventional figure of a person (Cox & Parkin, 1986; Gesell, 1925). There is a great possibility that these children had a model of the person. It is assumed that they were motivated because they were asked to draw their favourite persons. It means the children had a positive emotion towards the person. In addition, previous research indicated that a child has a complete internal model of the human figure (Arnheim, 1974; Brittain & Chien, 1983).

The typically developed children had a complete internal image of the figure (Luquet, 1927, 2001; Freeman, 1975; 1980; Inhelder and Piaget, 1958; Arnheim, 1974). They had the ability to transfer a three dimensional figure, with all its details, into a two dimensional figure. They had a plan for drawing the figure. They retrieved the model easily from memory. They had organizational and sequencing skills in transferring the model to the paper, and using the provided space effectively. They drew the figure in the middle of the paper. Most of them drew the head of an appropriate size in relation to the rest of the body. It is possible they did check with the model, and what they placed on the paper when they added a new part. They had appropriate fine motor coordination which helped them in drawing fine details such as fingers and toes. At the same time, it prevented them from forgetting what they retrieved from the memory. It is possible that most of the typically developed children were motivated to draw their favourite persons. It seems that they drew people frequently, and they were able to add new details to the drawings. It shows that the typically developed children were enjoying their time in the school, because they were high achievers. Their teachers and parents rewarded them. Their self-esteem was high. The reason for such interpretation is that we need to take a human being as a whole.

Looking at the drawings of both grade 1 children and the preschool children with learning problems, we find that the percentage of the children who drew a conventional figure was higher in grade 1 than the preschool. This percentage was lower than the percentage of the typically developed children who drew a conventional figure. The percentage of the children who drew the tadpole figure in the preschool children was higher than that in the grade 1. It is assumed that they have a solid internal model of their favourite person, but there was a difference in terms of the quality of work. The typically developed children were motivated. They made an effort, and they produced a conventional figure with fine details. The other two groups made an effort, but they produced a different type of drawings from that of the typically developed children. Only 6.25% of the grade 1 children with learning problems produced a conventional figure which had a similar quality to that of the typically developed children's drawings.

The percentage of children who drew both a transitional and tadpole figure in grade 1 children was lower than that in the preschool. There are several interpretations for the type of drawings which the children with learning problems produced. First, the children drew what they thought was important. Second, they drew what they wanted to draw, at that time. It is possible that next time they will produce a different drawing. Third, some children did not like to draw at that time, but they had to respond to the request of the authority. Fourth, some children did not have a plan for the drawing. It means that their fingers graphic movement was not organized and sequential on the paper. It was observed that some children either left light pencil marks on the paper or they pressed very hard on the pencil. Fifth, they had a problem in retrieving what was in their memory, so they did not have a plan. They struggled. Their drawings were random and less creative than the drawings of the typically developed children. Sixth, the children with learning problems had less self-esteem than the typically developed children.

The level of human figure drawing in this research discriminated between the typically developed children and the children with learning problems. Drawing of a conventional figure of human is important for writing in Arabic. This finding is

consistent with other research (Cox, 1993; Noqamza, 2002; Bonoti et al, 2005; Kutschera et al, 2005).

6.4.1.3 Writing a letter

Looking at the three groups' results, the children who made an attempt at writing a letter had a purpose for writing (Luckner & Isaacson, 1990; Silva, 1990). They were familiar with perceptual aspects in writing (Dyson, 1985; Tolchinsky-Landsmann & Levin, 1985). They knew the direction of writing in Arabic. They started from right to left. They wrote on a straight horizontal line. They grouped their letters or scribbles.

The writing of the typically developed children and some of the children with learning problems show that the children used their oral language and interaction with print in order to write their letters (Lu, 2006; Weinberger, 1996). These two sources provided the children with vocabulary which they needed to write. The writings show that the sound of the language, which is phonemic awareness, was important for the children. The children linked the phoneme with the grapheme in their writing (Adams, 1990; Bryant et al 1989; Byrne & Fielding-Barnsley, 1991; Tunmer et al., 1988; Lomax & McGee, 1987). This was clear, even in the writing of children who invented words.

All the typically developed children wrote sentences in their letters, with correct spelling. 37.5 % of the grade 1 children with learning problems wrote one sentence. 13.87% of the preschool children with learning problems wrote one or two words, but no sentences. The grade 1 children with learning problems were under the same circumstances as the typically developed children. They were expected to have some knowledge of the alphabet and vocabulary. In Bahrain, the preschool teaches the alphabet. The preschool children were expected to write some letters and a few words only. The children had problems in placing letters and words on paper. It is possible that they could not retrieve the knowledge from memory or they had forgotten what they had learnt. Another possibility is that they did not know how to form the letters (Graham et al, 2000)

The problem is that most of the children with learning problems did not write words or letters on the paper. I think it has to do with the classroom instruction. It is possible that it was not suitable to their style of learning or personality. If we look at the performance of the children who did not write letters and words on other parts of the test, we find that few of them drew a conventional figure and wrote their first name. All of these children could not copy the diamond shapes. Most of them scored below average on phonological awareness tasks, and they skipped a counter when they counted. The results show a link between writing a text, copying oblique, phonological awareness and counting. These skills depend on a child's social interaction with others. He needs to listen, and understand the language. He needs to interact with print through observing others, and modelling them. He observes how letters, words, and number are written. Then, he needs to learn to recognize, read, and write the alphabet or numbers. Motivation encourages the child to create his ideas and plan. The plan is based on his previous experience such as oral language, phonological awareness, print, drawing, and copying. It is important that the child understands the part whole relationship.

In this research, the scores on writing a letter identified the children with writing problems. This finding is consistent with the results of Monteith (1991) and Re, Caeran, & Cornoldi (2008).

6.4.1.4 Copying shapes

Before interviewing the children with learning problems, I searched in some primary schools for plastic or wooden shapes which I could use in the copying tasks in my interviews with the children. I found only circles, squares, and the triangles, but I did not find any diamond shapes. I asked one of teachers if she had a diamond shape in her class. She brought an octagon shape. This might indicate that the curriculum of grade 1 contains only the first three shapes, and the diamond is not part of it. When I interviewed the children, all the typically developed children copied the circle, square, and the triangle. The most common hand movement which they used was threading. In copying the diamond children, 82% of the children copied the diamond using threading. The other 12% of the children experienced difficulties in copying the shape. From their performance on the test, the typically developed children had

good memory. They retrieved the required information very easily. They could do appropriate planning, and they had appropriate pencil grip. They had good organization, and sequencing skills. These children wrote their full names, one to three sentences in their letters, and drew a conventional figure.

In relation to the children with learning problems, 25% of them copied the circle, square, and the triangle correctly, but they had a problem with copying the diamond shape. These children wrote their own names, few meaningful words, and drew a conventional figure. Based on this data, these children did not have fine motor problems.

The main reason is that these children were not familiar with the diamond shape in their context (Luquet, 1927; Piaget & Inhelider, 1956). They did not have previous information on the diamond to retrieve. Therefore, they did not have an appropriate plan. The curriculum in both the preschool and primary school do not include the diamond shape with other shapes. It means that the children were not exposed to the diamond in the school context. The children who copied the diamond correctly either were exposed to the diamond in a home context or they had advanced cognitive abilities which allowed them to make a fast internal image of the diamond, and create a plan. They used their part whole relationship capacity in their planning, and they had flexible graphic skills.

I observed that some children had several attempts at copying the diamond, and at the end they had produced a correct diamond. I found that some children started with a triangle or a square. It is possible that they used the information they had in their memory on either of the shapes, and did compare, and contrast. Some of them found, the diamond similar to the square. Others found it similar to the triangle (Maccoby & Lee, 1965). In this research copying oblique (diamond) discriminated between the typically developed children, and the children with learning problems more than the other items. Copying oblique is important for writing in Arabic.

In this research, I found that children aged 5-6 years old could copy the diamond shape, and children aged 7 years who could not copy the diamond shape. This finding

contradicts the norm which is 7 years in western countries (Maccoby & Lee, 1965; Berman, et al 1974; Beery & Buktenica, 1989).

6.4.2 Implication for writing

6.4.2.1 Assessment

Before entering school, children must be able to write their names, write some letters, copy at least a circle, square, and triangle; also they draw a conventional figure of human. The children who do not do that must be given some attention.

6.4.2.2 Curriculum

According to the competencies in appendix 3, the children are taught a lot of things which they need. I think the children need more attention, motivation, and different styles of learning. It is possible that the number of the children (n=30) in the class is large. The teacher might not have enough time to focus on the children with a problem. I suggest including the following:

- Free drawing and writing
- A class environment full with different shapes and models of letters.
- In the beginning, a focus on fluency of writing by asking children to select their own topics.
- Different types of writing such as personal letters, stories, lists and poetry.
- Handwriting as a second step after fluency of writing.

6.4.2.3 Teaching

The teacher needs to encourage children to draw what they like, and use it as a plan for writing.

- Instruction in handwriting. A teacher as a model shows children how to write mechanically. She demonstrates that what is said can be written, and this writing is meaningful for the child.
- Shared writing. Shared writing begins with a child dictating his personal experience (example picnic with family, fishing, and reading a story) to his teacher. The teacher writes exactly the child's words. Then, the teacher reads the story to the child. After that, the child reads the story too. During the

writing phase, the child observes the teacher writing the story. According to English language, she puts her hand on the upper left of a page, and begins to write from left to right. The child could notice the space she leaves between words. In addition, he pays attention to the way she moves the pencil. This experience gives a child an impression that writing, and reading are easy tasks, and they represent his oral language (Vocalic & Christie, 2004). In Arabic, The teacher begins to write from the upper right of a page, and from right to left.

6.4.2.4 Early intervention

The preschool could use play in the class corners to do the following:

- Expose children to their names and train them to write it.
- Children in Bahrain enter school age 6, so it is important to teach the children, in the last year in preschool, the alphabet and how to write the letters.
- Provide the children, a class environment, with different types of print such as letters, stories, menus and shopping lists, words, and letters on cards.
- Expose children to diamond shapes as well as other shapes.

6.5 Numeracy

This part consists of two sections. The first section is on the children's work in the additive tasks. The second section is on the implications.

6.5.1 Children's achievement on numeracy

On the additive tasks, 8% of the typically developed children used counting down from to solve the additive tasks. 16% of the typically developed children counted from 1. 74% of the children used counting on strategies. Only 2% of the children skipped an item when they counted.

In Bahrain, the typically developed children's use of fingers in their counting was slightly different from the strategy in the India children's pattern. In Bahrain, the child counted the visible three lines in each finger. Each finger is counted as 3 except the thumb. It is counted as 2. The child began counting from the top of the right index finger, and continued to the thumb. Then, he moved to the top of the

index finger in the second hand which is closed to the first index, and carried on counting until he reached the bottom of the thumb. The total counting in both hands is 30.

In summary, this different pattern of counting reflects the culture in each country. For instance, Muslims use the counting pattern that is used by Bahraini children after their five prayers. I wonder if the Indian pattern reflects a similar practice.

95.74% of the preschool children with learning problems skipped one or more counters when they counted the counters. They were very fast in saying the number word when their finger moved on the counters. They did not pay enough attention to coordinate the number word and the counter. 2.13 % of the children counted from 1, and the other 2.13% used counting on strategies. 95.83% of the grade 1 children with learning problems skipped one counter when they counted. They did the same as the preschool children. These children had a rote memorizing of the forward number word sequence. These children did not pay attention to the counters when they counted them.

In Bahrain, sometimes the verb count is used for reciting the forward number word sequence and for counting objects. For instance, a teacher might say to a child count from 1, and if she places some counters in front of the child, she also, says count how many counters. I think the children did not understand the meaning of the number word. They did not link the number word with the counter (Krajewski, & Schneider, 2008). Skipping one item during counting identified the children with learning problems in maths. At the same time, counting is important for arithmetic problems (Okamoto & Case, 1996; Aunola et al, 2004). This finding needs further investigation.

If we consider the performance of the children who skipped one counter when they counted, we see that 91.49% of the preschool children with learning problems in numeracy scored low in phonological awareness (Bradley & Bryant, 1983; Vellutino & Scanlon, 1987). They could not write meaningful words, and copy the diamond shape correctly. In relation to grade 1 children with learning problems, 77.10 % of them scored below average in phonological awareness, could not write

meaningful words, and could not copy the diamond shape. The results show associations among reading, writing, and maths. The three areas required oral language. The children learn these three skills during social interaction before joining school. The children need comprehension of the language in order to read, write, and count. For instance, in counting, number word is part of the oral language which needs to be understood by children. The three skills require previous experiences and an internal model of the symbols. They need retrieval of information from memory; also it is important that they understand the part whole relationship.

6.5.2 Implication

6.5.2.1 Assessment

The additive tasks could be used as a guide to identify children with problems in counting.

6.5.2.2 Intervention

This part contains intervention in the preschool, school, and at home.

6.5.2.2.1 Preschool and school

Both the preschool and the school could provide children with a shop and bank corners in the class. The children use the scale to weigh items and compare them. They count vegetables, fruits, and other items. The teacher observes children, and asked them to slow down if they counted fast and missed some items. The children go to the bank, and withdraw some money or change the notes into some coins. In this way the children enjoy their time, and learn counting. During this time, the teacher monitors the children's counting.

6.5.2.2.2 At home

Young children like to help their mothers, but some mothers do not give the children a chance to do that. It is possible they want to do their work very fast or they do not believe in children's skills. A mother could benefit from her child's interest, and create a learning environment away from paper and a pencil. She could involve her child in her daily work. She could ask the child to wash the fruits and vegetables. At

the same time, she might ask him to count them. For instance, she can ask him if the number of oranges is the same as the number of the apples. She could ask the child to clean, and arrange all the pairs of shoes. While he is doing that, she could ask him to count or sort them based on their size or colour. She slows him down if he tries to speed up while counting. These are just some examples of what a mother could do.

6.6 Coping strategies

This part consists of four sections. The first section is on the negative coping strategies the children used during the assessment. The second section is on the circumstances in school in Bahrain. The third section is on the circumstances in the research. The fourth section is on possible implications of the findings.

6.6.1 Children's coping strategies

This section is on the negative coping strategies the children used during the assessment. In this research children used coping strategies when they came across unfamiliar or difficult academic tasks. These findings are consistent with findings from other research (Yon Lee et al., 1999; Onatsu-Arvilommi and Nurmi, 2000; Robert et al., 2001; Damico et al., 2008).

6.6.1.1 Preschool children with learning problems

The preschool children with learning problems (5 -6 years) in this research used more "on task coping strategies" than "avoidance" coping strategies.The former is similar to problem fcoused coping and the later is similar to emotion focused coping (Lazarus & Folkman, 1984). The preschool children tried some solutions which they found useful in their previous experiences in home or a preschool context (e.g. reciting Quran, reading from a memory or picture, and rhymes). The types of the negative coping strategies the preschool children used seemed to be appropriate to their playful context. At the same time, a home or preschool context provided young children with some freedom. The "on task" coping strategies were relavant to the academic task. For instance, erasing was appropriate to drawing and writing. Usually, young children use an eraser to erase their mistakes, but here it is used excessively. The present finding is in line with that of Onatsu-Arvilommi et al (2000) young children used coping strategies while they were working on academic tasks.

However, Onatsu-Arvilommi et al (2000) mentioned that the children used only avoidance coping strataegies, and they did not mention the details about the coping strategies and the academic tasks. Their findings were in reading and maths only. They did not include writing tasks as in the present study. The age of the children in Onatsu-Arvilommi et al (2000) was 6-7 years old; whereas, in the present study, the age of the children was 5-9 years old (some children repeated grade 1).

The preschool children used more coping strategies while they were working on the additive tasks (preschool n=23, grade 1 with problems n=6) than in other tasks. They used both "on task" (n=23), and "avoidance" coping strategies (n=6) s. The first one was the most. They used more styles of coping on the additive tasks (n=6) than other tasks. This shows that the preschool children experienced too much difficulty with maths. This was clear from the children's scores on the test. Most of them had a problem in one to one correspondence which is a very basic concept in counting (n=45). The additive risk model in the analysis showed that maths (the additive tasks) was one of the predictors for future learning problems in reading (Duncan, 2007).

It is possible that the preschool children did not have enough meaningful maths experiences gained through social interaction in the home or in a preschool context. A second possibility is that they were taught maths in the home or the preschool sitting in an abstract form without using concrete methods in order to understand the main concepts. In terms of the maths tasks, they need more attention than other tasks, and they require understanding of concepts. The preschool children showed that they are still playful and it was difficult for them to focus on the tasks. Duncan et al (2007) found that attention skills and maths at school entry predicted future academic attainment.

The preschool children used more "on task" coping strategies than "avoidance" coping strategies while writing a letter (preschool N=17, grade 1 N=8). This information showed that the preschool children experienced difficulties on the task. They were not familiar with writing text, so they were struggling. In Bahrain, parents believe that teaching reading starts with reading symbols and writing. In the preschool, there is no clear curriculum. The children are taught the sound of the letters or the name of the letters from age 3. Teachers spend a lot of time on these

tasks, and they provide children with homework under pressure from parents. The preschool children develop an understanding that they have to do well on such tasks. Preschool children use of "on task" coping strategies more than "avoidance" contradicts other findings (Harris, Olthof, & Terwogt, 1981; McCoy & Masters, 1985; Reissland, 1983; Altshular & Ruble, 1989) which indicated that younger children used more behavioural distraction coping except the study of Band & Weisz (1988). Band & Weisz indicated that younger children reported problem focused coping more than emotion focused coping. However, these previous research was in social or medical uncontrolled situations, and most of them was based on children self-report which might not reflect the reality.

6.6.1.2 Grade 1 children with learning problems and coping strategies

Grade 1 children with learning problems (7 years old and over) used both "on task coping strategies" and "avoidance coping strategies". They were more flexible in their selection of negative coping strategies. They did not use the same "on task" coping strategies which were used by the preschool children with learning problems (above examples). It is possible that they used them in the beginning of the year when they joined the school, and the timing of this research was at the end of the year. Children found them inappropriate, so they invented other solutions which they thought they could be appropriate for the school context. For instance, they used the "taught strategy" in the additive tasks. The flexibility in selection of this age group's coping strategies was found in Band and Weisz (1988), and other studies (Caplan et al., 1991; Compas, Malcarne, & Banez, 1992; Compas, Worsham, & Ey, 1992; Wertlieb et al., 1987). However, the previous studies were not in academic context. They were used in social, medical context and after receiving low scores, except in the studies of Yon Lee et al (1999); Onatsu-Arvilommi and Nurmi (2000); Robert et al (2001) and Damico et al (2008). The "avoidance" coping strategies which were found in this research are similar to emotion focused coping in the studies of Lazarus and Folkman's (1984, 1986) and avoidance copings in Moos and his colleagues studies (Billings & Moos, 1981; Ebata & Moos, 1991) and the studies of Sandler et al (1994). They are also similar to off-task behaviours (Lee, et al, 1999; Robert et al., 2001). In this research most of the "avoidance" coping strategies were verbal.

However, the previous studies in academc context reported that children used only off-task or avoidance coping strategies.

The "on task" coping strategies which the grade 1 children with learning problems used did not involve talking. This might give an impression that the grade 1 children with learning problems had low self-esteem, and were emotionally disturbed. It is possible that the grade 1 children went through the same experiences which were explained in the preschool section in terms of ineffective interactive learning in home and preschool experiences, and no smooth transition to school. No talking coping strategies might be an indication that these children were moving towards "avoidance" coping.

6.6.1.3 Summary

There are some negative coping strategies which were shared among the children and others which were specific to a child. Examples of first type were the "taught strategies", "rhymes", "small drawing" and "frequent erasing". Examples of the strategies which were specific to a child are "*my stomach is paining me*". At the same time, the children developed coping strategies from the nature of the task, and were used in that particular task. For instance, the "taught strategies" and rhymes were used only in numeracy tasks whereas frequent erasing, small drawing, "*I cannot write my full name. They did not give me writing*" were used in writing. In reading, an example was "*I cannot read. I am just in grade 2*". Other coping strategies were general, and were used in reading and numeracy such as guessing and eye contact; whereas "*I do not know*" was used in reading, writing, and numeracy.

6.6.2 Circumstances in the school

This section includes three parts. The first part is on the transition from home or preschool to primary school. The second part is on the curriculum of grade 1. The third part is on the policy of primary education.

6.6.2.1 Transition from home or preschool to primary school

Inadequate transition from home or preschool to school could create tension in some children (Smart et al, 2008; Onatsu-Arvilommi et al, 2000). This was clear from the large number of coping strategies used by preschool children within two months of

school entry. It is important that young children are prepared to enter primary school (Smart et al, 2008; Conner, 2007). Preparation includes emotional and social regulatory skills as well as reading, writing, and maths (Belsky & MacKinnon, 1994; Ladd & Burgess, 2001). In Bahrain, young children are not prepared emotionally to enter school. At the same time, parents and class teachers in both preschool and primary school are not educated in this area. Some children panic, have temper tantrums, vomit and become sick. The mental image they built about the school might contradict the reality. They are left alone in a large crowded place with children moving from one place to another. They are faced with lots of homework; have to carry heavy bags on their backs from home to school, and vice versa.

When these children enter formal school, they are faced with high parental expectations. At the same time, most primary teachers in Bahrain expect the preschool children to know their symbols and follow rules and regulation. These circumstances create stress for the preschool children who lack emotional and social skills (O'Kane & Hayes, 2006, Duncan et al, 2007; Stephen & Cope, 2003; Belsky & MacKinnon, 1994; Ladd & Burgess, 2001). Some children might find it difficult to focus in the class, and this is an important skill for success. They used some coping strategies to deal with the stress. These results are in line with Liew et al (2008), in which they found that self-regulatory skills at school entry are important for future reading.

The normal reaction from parents who are not aware of the difficulty of this transition period is to become angry, and insist that their children stay at school. Primary schools need to educate parents about the sensitivity of the transition period on children. Parents need to understand, and to listen to their children. Parents and class teachers need to pay attention to it, and change these children's perception to the school. These children need to express their feelings. They need to develop a purpose for attending the school. They are required to be motivated and to stay in the school. If no attention is provided to this serious problem, some children who cannot tolerate school, and are placed there against their will, might built a rejection towards school. This rejection might stay for a long time. The rejection leads to stress. As a result, they did not do well in the test. Some children invented their coping strategies.

These children were low achievers in the school at the end of the year. This interpretation is in line with Niemi, et al (1998).

6.6.2.2 Curriculum

The curriculum in primary education in Bahrain is based on a behavioural approach. It is condensed. The teacher wants to finish the curriculum on time. It is very structured and provides children with little freedom. It does not consider the individual differences between the children and their styles of learning.

6.6.2.3 Policy of evaluation in primary education

The evaluation of the children in primary education is based on the competencies of the behavioural approach. The children who fail in the competencies of reading, writing, and maths at the end of grade 1 are transferred to grade 2 because the Ministry of Education in Bahrain has a policy of no failure in grade 1 (see appendix 3). The grade 1 class teacher moves with the children to grade 2. The children who had problems in grade 1, in the competencies in one of the above areas, receive support from a special education teacher. The support is based on the grade 1 teacher's evaluation of children in grade 1 competencies. The special education teacher teaches the children the competencies in which they were weak. There is no other assessment procedure. At the same time, these children have to learn the competencies of grade 2.

Few children repeat grade 1. They stay in the same grade based on a decision made by the school, and approved by the children's parents. These children receive the same curriculum. They receive support in the competencies in which they did not achieve in the previous year.

At present, the Ministry of Education is revising the curriculum of primary education, and the teacher-training program. It means that they are aware that there is a problem. This is a positive point which needs to be considered. Some of the grade 1 children who did not do well in both the test and in the school benefited emotionally from the policy of no failure in grade 1. At least they were kept in the same class with their peers, but they were challenged with a more difficult curriculum, and they did not receive appropriate support. The result was that they were placed under more tension

than before. It is worth mentioning that they had the same teacher except, in rare situations. Having the same teacher might be a disadvantage for the poor achievers.

6.6.3 Circumstances of children in this research

In this research we have two groups of children. The typically developed children in grade 1 were the top five in their classes and scored very highly in this research assessment. Few of them used coping strategies on copying the diamond only because they were not familiar with it. At the end of the year, all of them moved to grade 2. The other group is the children with learning problems, the preschool children who enter grade 1 and grade 1 children who entered grade 2. The children in both groups were evaluated by the class teachers as the two lowest achievers in their classes. In the test, most of the preschool children (low scoring in reading=93.62% both phonological awareness and concepts of print), (low scoring in writing=76.6% numeracy=95.74%) and grade 1 (low scoring in reading=79.17%, writing=43.75%, numeracy=87.5%, total N=48) did not do well. Most of the children who scored low in reading did not do well on writing and numeracy too. 63.16 % of the children in this group used coping strategies, and they did not score well at the end of the year in the school. Few of them repeated the same class.

All children had the same curriculum in the school, same size of class, materials, and same evaluation system, but different peers and teachers. It is possible that the behavioural approach was suitable for the typically developed children in this research, but it was not suitable for the style of learning for the children with learning problems. This approach did not match their needs. They may need to work on their own and explore. They may need more freedom and motivation. The approach could not identify their strengths. These circumstances might create stress for these children (Stephen & Cope, 2003). In addition, it is possible that the teachers were not qualified enough and were not appropriate for these children. The teachers could not understand these children's needs. It is possible that the teachers were structured by the curriculum, and its intensive size. They want to finish the curriculum on time, so they did not pay attention to the children with learning problems. It is possible that some teachers did not build good communications with the children. At the same time, some children had the same teacher for more than one year. Such circumstances

placed some of these children under too much tension (Conner, 2007). This might explain why the children did not do well on the test and school outcomes, and they used coping strategies.

The few children who repeated the same grade were forced to carry a stigma of failure which may last for a period of time. They were separated from their peers. They were doing the same curriculum for another year. Doing the same thing could be boring for the children. It is possible that they had low self-esteem, and were not motivated. The data provided evidence that the children who used both "on task" and "avoidance" coping strategies were older children. It means they were not comfortable, and paid less attention to the academic tasks. This data is in line with the Onatsu-Arvilommi and Nurmi (2000) finding which indicates that the children who used "avoidance" strategies felt low self worth and helplessness.

6.6.3.1 Aspects other than academic contribute in the children difficulties in the school

In the five case studies it shows that there are aspects other than academic that might cause the children difficulties in school. These are the child's interaction with the teacher, home atmosphere and the child's character.

6.6.3.1.1 Quality of the teacher

The quality of the teacher is very important. For instance, in Mariam's situation, it shows a clear difference between the two teachers' approaches to the girl. The first teacher was not aware of the girl's needs. She did not have appropriate interaction with the child. She did not link the coping strategy which the girl used to the task the girl was working on during that time. It appears that the teacher did not provide her a challenging experience that was adapted to the limit of her competency, so she did not produce an achievement. Consequently, she was not motivated to learn. I think it is important to make sure that every child is engaged in the activities. The teacher is required to control, and mange each child's learning.

The second teacher seems to have good communication skills. She was able to make the child secure, and change her behaviour. As a result, a positive change in her academic attainment was observed. In Amal's situation, I understood from the head

teacher, that the school did not have this teacher who is popular among children, when this girl was in grade 1. The same could be applicable for the other three cases, and the rest of the children. It can be concluded that lack of effective communication skills between these children, and their class teachers was one of the causes for failure in the school. It was a possible cause for creating avoiding strategies.

6.6.3.1.2 Teaching and learning styles

Teaching which is based on rote learning results in short-term learning and it doesnot provide children with effective strategies to solve academic tasks and make generalization. This was clear from the report study conducted by Fargini (200) in Bahrain. It also doesnot considerchildren's different styles of learning. It is possible that some children used these negative coping strategies as an alternative.

6.6.3.1.3 Home atmosphere

A warm home atmosphere is important for nurturing children. Good relationships between parents have an impact on their children. For instance, in Amal's case, the parents are divorced. The mother is sick. Amal had difficulties contacting her father. These aspects had an emotional effect on Amal. She was not attentive in class, and had low achievement. To avoid criticism and embarrassment, she stopped going to school as a coping strategy. In the case of Khalid, his parents did not follow up with the school. It is possible they were busy with other things. They did not show interest in his achievement in the school. These cases show the importance of the home environment in children's lives.

6.6.3.1.4 Child's character

Yousif is a social child who likes to talk. It is possible that he talks to other children when the teacher teaches. Asking him to stop talking every time he is caught talking might not be a permanent solution for the problem. The teacher needs to think to give him a role when she does not teach. It helps him to spend his energy, and talk less during the lesson (Niemi, 1998). Khalid is described as a quiet boy. He does not communicate with others. This has an effect on his learning in the school because the children at this stage depend on oral language and doing things. In the case of Mariam, her appearance, with thick pair of glasses, could be a reason for the first

teacher's attitudes towards her. The teacher might perceive her as a low achiever, so she did not provide her with enough attention.

6.6.4 Implication for coping strategies

Stress has an effect on children's well-being, and their academic achievement in school. Dealing with this problem needs collaboration from both parents and school.

6.6.4.1 Curriculum

It is important that stress, and coping is included in various parts of the curriculum: For instance:

- In biology and mental health, children are provided with a simple scientific explanation of stress in the body, and a person's reaction towards it, and the negative effects.
- In reading, children are provided with a reading topic on stress, and what can be done.
- In writing, the children can be asked to write about stress in a particular situation or the children select a stressful situation that bothered them, and what they did to deal with it.
- In art, children draw what bothers them or bothers someone else.
- In drama, children make a role play on a stressful situation.

Another point is to consider the individual differences in the construction of the curriculum. For instance, the curriculum-based curriculum (Behavioural approach in Bahrain) worked with the typically developed children, but it did not work with the children with learning problems. They did not do well on the research test, and they fail in the school tests too. At the same time, they developed ineffective coping strategies.

6.6.4.2 Teacher training

It is important to include emotion regulation as part of child development in children. Topics such as transition from home to school, stress management, and coping strategies need to be considered.

6.6.4.3 Intervention:

There are two types of intervention that could help children to deal with their problems. The first intervention is to educate the teachers to use some techniques to identify the children stressors, and help them to release their tension. The other intervention is to educate parents in order to prevent exposing children to stressful situations.

6.6.4.3.1 Teachers

Young children come across some stressful situations in a class environment (Bodrova & Leong, 2006; Hamre & Pianta, 2005 in Connor, 2007). The cause of the stress varies from one child to another. It is important that the class teacher identifies the daily stressors in the class.

6.6.4.3.1.1 Identifying daily stressors

The first step in finding a solution for young children's use of ineffective coping strategies is to identify the daily stressors in the class environment. First, the class teacher could do daily observation to identify the stressors. Second, she could cooperate with the children through organizing some activities.

6.6.4.3.1.1.1 Observation

It is important that the class teachers focus on the behaviour which bothers some children, and might affect their academic achievement such as bulling, withdrawal, attention problems, headache, and abdominal pain. If the behavior continued she should do further enquiry by communicating with the school, social work, and parents. At the same time, she can try to find the timing of the behaviour, how frequent, and whether it is on a particular task (Fallin, Wallinga, & Coleman, 2001).

6.6.4.3.1.1.2 Activities

Fallin et al (2001) suggested some activities that the class teacher can share with young children to identify their stressors. They are as follow:

6.6.4.3.1.1.3 Griffith's board

The class teacher covers the board with a large blank paper, and writes a title such as "things that are stressful for me". She asks the children to express themselves by writing the things which bother them or create problems for them. Sometimes, she could use a box. The children could write on a paper whatever they find stressful, and put it in the box. Later, the teacher facilitates a discussion with the children on some topics relevant to the children's stressors.

6.6.4.3.1.1.4 Large group discussion

The teacher could organize a discussion with the children on something like "feel bad scale" for Charles Lewis and his colleagues (1984). The scale is based on three questions. These are: "What makes you feel bad, nervous, or worried? How often has it happened in the last (...)? How did this make you feel?"

The scale allows the children know that other children share with them the same experiences and this is itself makes them feel better. At the same time, it gives them a chance to express themselves in words. The children who do not like to talk in front of others could write or draw. The teacher collects their drawings, writings, and discusses them without referring to the children. Etal (2001) suggested a "funny activity" in which the children draw some bugs, colour them, and cut them. Then, they write on them what bugs them.

6.6.4.3.1.2 Actions

The teacher sorts the stressors on the basis of how frequent they are and the effect on the child's safety and achievement. Then, she tries the following:

- Remove the stressor. For instance, if a child is sitting at the end of the class, and he cannot see what is written on the board, he could change his place.

- Change the child's perception of the stressor. Sometimes, it is difficult to remove or change the stressor. For instance, the child does not like to do his homework. In this case she might think of a way to motivate him, and present the homework in a different way for him.
- Focus on the positive events. The teacher could do brain storming with the children, and ask them about some happy occasions which the children had in the past, and use them to deal with their stress.
- Effective coping strategies. In a group discussion, the teacher use brainstorming. She asks the children to tell her some of the effective coping strategies which were useful for them. She could ask the children some questions such as:

  "What made you feel bad, nervous, worried? What did you do? What made you feel better? What did you do that helps you the most?" (Ryan, 1989).

- Relaxation: Class teacher teaches children relaxation techniques. Consider suggesting to a child such things as "take three deep breaths"; "count backwards"; "tense and release your muscles"; "play with play dough"; "dance"; "imagine a favourite place to be and visit that place in your mind" (O'Neill, 1993).

6.6.4.3.2 Parents

Primary schools, with the cooperation of other institutes such as preschool, health, social centres, and media, should try to reach parents, and educate them in the following areas:

- The importance of the transition period for the children when they enter primary school, and explain to them their role in helping their children.
- Development of self-regulatory skills is as importance as academic skills.
- Keeping children away from adult's problems.

6.7 Children's achievement and the appropriate timing for the assessment

This part consists of two sections. The first section is on the children's achievement on the assessment and on the school outcomes. The second section is on the most appropriate time for assessing learning problems.

6.7.1 Achievement of children with learning problems

This part is on the performance of children with learning problems on the assessment, and on the school competencies in reading, writing, and maths.

6.7.1.1 Achievement of children with learning problems on the test

In the assessment, all the children had difficulties in one or more parts of the test. Most of the children with learning problems who had difficulties in reading had difficulties in writing, and numeracy also. It might indicate there is a relationship among the three areas, and the importance of reading for both writing and numeracy. Numeracy was the most difficult task. This finding is consistent with Duncan et al (2007). It means that the children with learning problems lack attention when they worked on the academic tasks. It provides evidence that they were busy with their coping strategies.

6.7.1.2 Achievement of children on the school competencies and use of coping strategies

The children with learning problems who had difficulties in 3 to 4 areas of the test did not do well on the competencies of reading, writing and maths in the school at the end of the year. These children represent more than 2/3 of the group. Most of these children used negative coping strategies during interviews. The children who had difficulties in one or two areas of the test, and few of the children who had difficulties in more than two areas, did well on the school competencies. These children did not use coping strategies during the interviews.

At the same time, the children who performed well on parts of the test were older children. Most of the older children were from grade 1. This indicates an association between the achievement of the children in the test and age

6.7.2 Prediction of achievement

There are subtests which predict future achievement in reading, writing, and maths in the school. In reading, the subtest on identifying the initial sound (phoneme) in a word was the best predictor for the whole group of children with learning problems and the preschool children within the group. This finding is consistent with the

previous findings in Arabic language (Haddad (2007) and other orthography such as Norwegian (Høien et al. 1995) and Finnish (Müller & Brady 2001). Whereas the subtest on identifying some words in the storybook was the best predictor for grade 1 children with learning problems.

In writing, the subtest on writing one's name was the best future predictor for the whole group of children with learning problems and the preschool children within this group. Whereas the subtest on writing a letter for a favourite person was the best predictor for grade 1 children with learning problems.

In numeracy, the additive tasks in counting predict future achievement in maths for the whole group of children with learning problems and the preschool children within this group. It is a weak predictor for maths achievement in grade 1 children with learning problems.

6.7.3 Appropriate time of assessing the children

There are four important aspects to be considered before making decision about the timing of the assessment. The first aspect is that the preschool children were not familiar with the tasks in the assessment, and this was a cause of their struggle. As a result, they use an increasing number of the coping strategies. Some children do not have enough reading, writing and numeracy at home or preschool. Other children come from low socioeconomic families who cannot afford to send their children to preschool (Hadeed & Sylva, 1999).

The second aspect is emotional adjustment. Most of the children at the end of grade 1 are more adjusted to the context of the primary school than the children who just joined grade 1. In addition, the children are provided with enough time to develop. The children, who did not have previous experiences with Arabic books, and Arabic alphabet, will come across such experiences through teaching

The third aspect is that the grade 1 children used more emotion-focused strategies, and some of them used problem-focused strategies which showed signs of moving toward emotion focused strategies. I think these coping strategies are more dangerous than the problem focused strategies which were used by the preschool children. They have effects on the children self esteem, health, and might last for a long time.

The fourth aspect is that older children's achievement on the test was better than the younger children. Most of the older children were from grade 1. This finding is in line with Hadeed and Sylva's study (1999). The test for grade 1 children was more reliable than the test of the preschool children. Putting these aspects in mind, it is better to assess the children at the end of grade 1.

6.8 Use of the test in Bahrain

Although the sensitivity of the screening test achieved satisfactory levels with cut-off based upon two or more areas of difficulty, its specificity falls below the level that might be regarded as adequate for a universal screening instrument (Butler, 1988; Boyle, Gillham & Smith, 1996). However, the test is appropriate for use by teachers of children aged 5-7 years in Bahrain as a baseline diagnostic tool for use in grade one. The instrument could thus be used in two ways. Firstly, it is appropriate as a baseline assessment of early literacy and numeracy. Secondly, it could be used as a diagnostic test to identify gaps in the learning of grade one pupils.

6.8.1 Baseline assessment

A baseline assessment may be used for four purposes. The first purpose is to identify children with special educational needs at an early stage. Therefore, this type of test could be used with all children to profile their skills, and to identify those at risk of developing learning difficulties. Based on this assessment, those identified as having learning difficulties in key skills would be referred to a school psychologist for further investigation. Second, the baseline assessment allows the teacher to monitor the progress of all children including those with learning difficulties. It helps to ensure the progress by assisting teachers in providing an appropriate curriculum and in considering individual differences among the children (Lindsay & Desforges, 1999). Third, the baseline assessment allows the school to take decisions about the needs of each child in order to plan for teaching, and provide the resources required. The school might need to contact other agencies outside the school. Fourth, the baseline assessment increases the school accountability. It allows the school to judge the children's progress as opposed to their absolute level of achievements. Also, it provides the school with data on areas in the curriculum which need improvements. For instance, if most of the children scored very low in reading it means, there is a

need for improvement in the curriculum, instruction, learning environment or assessment procedures. In Bahrain, we do not have baseline assessment. Table (6-1) is a suggested form of the test which can be used as a baseline assessment:

Table 6-1 Use of the test as a baseline assessment before school entry

Area	Items
Reading	1. Phonological awareness Task 3 identifying the shared sound at the end of two words (rhyme). 2. Concepts of print • Hold a book in an appropriate way and open it from right to left. • Point at the story • Point at the front and back of the book • Point at some letters
Writing	3. Writing first name only with correct spelling. 4. Drawing a human figure. The child is required to draw a circle for the head. Big circle or oval shape for the torso. For the Legs and arms it is enough to draw sticks for the preschool only. The size of the figure or the head in relation to the rest of the body is not important at this stage. 5. In writing a letter. It is enough if a child writes a string of some Arabic letters on a horizontal line from right to left. 6. In coping shapes. A child is asked to copy a circle and square only.
Maths	7. Two visible collections of counters will be placed in front of the child (e.g., 4 and 5). The child will be asked to say how many counters altogether. It is enough if the child provides a correct answer by counting from 1.

This baseline assessment could be used in the beginning of the final year in the preschool. At this period the children have reached age 5. In the context of the preschool situation in Bahrain where the preschool have no formal curriculum, and no reliable and valid test to monitor the children's development, I think the test could provide the teacher with important information about the child's development and knowledge. This test could help the teacher to construct, and differentiate the future curriculum for the children with learning difficulties. She could provide the children who did not do well on reading tasks with more interaction with print and rhymes. She could refer the child to a school psychologist for further investigation. However, it is important that the teacher does not teach the test.

This baseline assessment could be used with new entrants to grade one. Some of these children had a chance to enter a preschool. Others did not. The test provides the class teacher with information about what a child could do and could not do. It provides the teache an apportunity to perceive each child as a unique individual. At this stage the teacher could ask the special needs teacher to help the children who had difficulties in the test. The test helps the class teacher also to select a starting point in the curriculum which is appropriate for each child. She needs to select the appropriate competencies which are not very easy or very difficult for the child level. At the the same time they provide him with a challenge.

One important point is that the additive risk model used in this study showed that difficulties in two or more areas of the test predict future learning difficulties. It means that using the test allows the teacher to find the children who have difficulties in two areas or more of the test. These children are at risk of having future learning difficulties in reading, writing or maths.

6.8.2 Use of the test as a diagnostic instrument

The test can also be used as a diagnostic tool for specific children aged 6-7 years in grade one for whom there is a risk. It can be used as a diagnostic baseline assessment in the final year of the preschool, and at the beginning of grade one. During the second term of grade one, the class teacher could use the form of test which is used in this research to inform the monitoring of the children's development or could be administered only to the children whom she suspects have difficulties in reading, writing and maths. Based on the results of the assessment she could refer the children who need a support service to the special education teacher.

Both the baseline assessment and the diagnostic test help the class teacher to revise the instructional methods and pace of teaching, and to plan learning experiences that will be motivating and challenging for each child. In this case, there is a need for the department of curriculum to establish a unit for resources related to the curriculum in order to provide the schools with different materials to support teachers in delivering the curriculum and be creative in their teaching.

As Salvia and Ysseldyke (2004) noted, the ability to understand the assessment items and to respond accordingly is a central point. Accordingly, it is important to note that the mode of presentation of an item in the test might affect some children's perceptions of what they are required to do, and the way they might cope with the demands. Thus, difficulty with a test item might reflect the way in which the item and task are presented rather than an underlying learning difficulty, and use of a coping strategy. This would be the case for a child with a hearing or visual impairment, or a child whose first language is not Arabic, although an Arabic-speaker. This issue needs to be considered in the training workshops for teachers who will administer the test.

6.8.3 Workshops for the teachers in the preschool and grade one

Before I introduce the test to the teachers in the preschools and primary schools, I am planning to meet the Head of the Primary Education in Bahrain and some principals of the preschools in the country in order to inform them about the findings of this research. I will explain to them the importance of a baseline assessment for the children before they enter the school. Also, I will emphasize the importance of using a reliable and valid diagnostic test with children who are suspected to have reading, writing and numeracy problems. I will talk about the intervention programs that the teacher of special education could use to deal with different problems. Then, I will discuss the negative coping strategies that some children might use when they come across a difficult task, and what can be done to help them. I will focus on raising class teacher awareness of such coping strategies, and how important it is that the teacher finds out if these coping strategies are associated with the level of the task introduced to the child.

Later I will organize workshops for the teachers in preschool and primary schools. I will train them on using the test as a baseline assessment and diagnostic tool. I will emphasize that the teachers should not use the test with children with sensory impairment and those whose first language is not Arabic. I will discuss with the teachers coping strategies and what can be done to help children to deal with stress. I will provide them with the list of coping strategies in Arabic. Later, I would contact the teachers to collect their comments on the test application, and the coping

strategies they found in the class which will inform future use of the instrument and further research.

The test can be used as a diagnostic tool for children aged 5-7 years. It can be used as a diagnostic baseline assessment in the final year of the preschool and at the beginning of grade one.

6.9 Limitations

These are some limitations of the present research:

- The sample of both grade 1 children was small. Therefore, the specificity was less than 80%. There is a need to increase the sample of grade 1 or to add a group of typically developed preschool children. In this case all the grade 1 and preschool children will be included in the predictive validity.
- There is no prior information about the children's socioeconomic background.
- There is no information about whether the children had problems other, than reading, writing or maths.
- There are not enough tasks on both identifying the shared initial phoneme in the beginning of two words and the shared sound at the end of two words.
- The typically developed children's sample was not collected at the same time as the main sample (children with learning problems). The typically developed children were only from grade 1. There is a need to include preschool typically developed children.
- There is no information about other variables such as teacher qualifications.
- Concepts of print test which was used in this research was informal, and not a standardized test. This might have an effect on the type of predictive item for reading problems.

7 Conclusion

7.1 Introduction

This chapter summarizes the main conclusions from this research and implications for practice. The first part includes the findings on the test. I begin with the main finding on the test as a whole. Then, I include the findings in the subtests, reading, writing and numeracy. The second part contains the main findings on the coping strategies that the children used on the academic tasks. The third part is on the children's performance on the test. The fourth part deals with prediction of children's achievement in the future. The final part is on the appropriate timing for assessing the children's learning problems.

7.2 The test

1. A reliable and valid confirmatory screening test was developed to identify reading, writing and numeracy-learning problems in young children aged 5-7 in Bahrain.
2. The additive risk model showed that two or more areas of the test predict the children's future learning problems in reading, writing and numeracy.
3. Some children who had reading problems also experienced problems in writing and numeracy.

7.2.1 Reading

4. The sound of the letter is important for reading in Arabic.
5. Phonological awareness is important for future reading in Arabic.
6. Phonemic awareness is important for future reading in Arabic.
7. Awareness of print is important for future reading in Arabic.

7.2.2 Writing

8. Copying the diamond shape is the most important item for writing in Arabic

9. Age 7, as a norm for copying the diamond shape in the western society, is not applicable in Bahrain. Most of the children who copied the diamond were 5-6 years old.

10. "Threading; indicates fine motor development in young children in Bahrain.

7.2.3 Numeracy

11. Linking each number word to an item in sequence is important in counting in young children in Bahrain.

7.3 The coping strategies

12. Most of the Bahraini young children use negative coping strategies when they come across a difficult or unfamiliar academic task.

13. Most of the Bahraini young children with learning problems used both "on task" coping strategies and "avoidance" coping strategies when they come across a difficult or a familiar academic task.

14. Bahraini young children were selective in their negative coping strategies. Some coping strategies were linked with the type of task, such as the "taught strategies", the"rhymes" which were used in numeracy and "frequent erasing" in writing. Other coping strategies which were general, such as "*I do not know*" and "*guessing and eye contact*", were used in more than one task. The rest of the strategies were specific to a child.

7.4 Performance of the children with learning problems

15. Aspects other than academic, such as the type of the relationship a child develop with parents and children and his character, could contribute to his low achievement in the class

16. There was an association between the children's achievement on reading, writing, and numeracy tasks.

17. Most of the children with learning problems, who did not do well on the test, did not reach competencies in reading, writing, and maths in the school, at the end of the year.

18. The preschool children did not have enough reading, writing, and numeracy.
19. There is an association between learning problems and coping strategies.

7.5 Prediction of achievement

20. In reading, the subtest on identifying the initial sound in a word is the best predictor for reading achievement in the whole group of children with learning problems and the preschool children within this group. The subtest on identifying some words in the storybook is the best predictor for reading achievement in grade 1 children with learning problems.
21. In writing, the subtest on writing one's name is the best predictor for writing achievement in the whole group of children with learning problems and the preschool children within this group. The subtest on writing a letter to a favourite person is the best predictor for writing achievement in grade 1 children with learning problems.
22. The strategy in counting predicts achievement in maths for the group of children with learning problems and the preschool children within this group only. It is a weak predictor for grade 1 children with learning problems.

7.6 Appropriate timing for assessing learning problems

23. There is an association between the children's achievement on the test and their age at observation.
24. It is more appropriate to assess learning problems in reading, writing and numeracy in young Bahraini children at the end of grade 1 than at the end of the preschool.

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Appendix (5)

1. Ethics (a copy of the application form sent to the ethics committee in the University of Strathclyde)

UNIVERSITY OF STRATHCLYDE

APPLICATION FORM FOR UNIVERSITY ETHICS COMMITTEE AND DEPARTMENTAL ETHICS COMMITTEES

This form applies to all investigations within the remit of the University's Code of Practice on Investigations on Human Beings. This includes all investigations with human participants undertaken by staff or students of the University of Strathclyde which falls within the remit of the University Ethics Committee (see Code of Practice, para 5.1) or the Departmental Ethics Committees (see Code of Practice, para 5.2). However, this form should NOT be used for any investigation involving clinical trials (see Code of Practice, para 6.4) or medicinal products, nor for investigations involving staff, patients, facilities, data, tissue, blood or organ samples from the National Health Service. Applications for ethical approval for investigations involving the National Health Service in any way must be made under the governance arrangements for National Health Service Research Ethics Committees (see Code of Practice, para 3.2(d)) and where ethical approval is required from the NHS using the form issued by COREC (see Code of Practice, para 6.1).

Information sheets for volunteers and consent forms to be used in this study should be submitted with the application form for consideration by the Committee.

The application will be judged entirely on the information provided in this form and any accompanying documentation - full grant proposals to funding bodies should not be attached. Please explain any abbreviations, acronyms etc that you use. The Code of Practice (http://www.mis.strath.ac.uk/Secretariat/Ethics.htm) contains guidance on completing this application, on information sheets and on consent forms.

Applications which are not signed and/or do not include the required additional forms (e.g. participant information sheet and consent form) will not be considered by the University Ethics Committee and will be referred back to the Chief Investigator.

The form is designed for completion in Word, and should in any case be typed rather than handwritten. The grey-shaded text boxes on the form will expand to allow you to

enter as much information as you require. If you have difficulty filling out the form in Word, please contact Fiona Campbell in the Secretariat **(ext. 2101).**

Checklist of enclosed documents

Document	Enclosed?	N/A
Participant information sheet(s)	☐	☐
Consent form(s)	☒	☐
Sample questionnaire(s)	☐	☐
Sample interview format(s)	☒	☐
Sample advertisement(s)	☐	☐
Any other documents (please specify below)	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐

1. Chief Investigator (for the purposes of this application, this should always be the person responsible for the study at Strathclyde)

Name: Dr Penny Munn

Status (e.g. professor, senior lecturer): Reader

Department: Childhood and Primary Studies/Education

Contact details: Telephone: (77)3746

E-mail: "Penelope Munn" <penelope.munn@strath.ac.uk>

2. Other Strathclyde Investigator(s)

Name(s): Amina Harmas Alhajeri

Status (e.g. lecturer, post-/undergraduate): PhD student.

Department(s): Childhood and Primary Studies/Education

If student(s), name of supervisor: Dr Penny Mun

Contact details: Telephone: 7979737787

E-mail: Amina Alhajeri@strath.ac.uk

Please provide details for all investigators involved in the study (*the text box below will expand to allow details to be entered*):

3. Non-Strathclyde collaborating investigator(s)

Name(s): None

Status:

Department/Institution:

If student(s), name of supervisor:

Contact details: Telephone:

E-mail:

Please provide details for all investigators involved in the study (*the text box below will expand to allow details to be entered*):

4. Title of the investigation:

Screening literacy and numeracy problems at age 5-6 before school entry at in Bahrain

5. Where will the investigation be conducted? (Note that the Committee reserves the right to visit testing sites and facilities)

In the Kingdom of Bahrain/ kindergraten and grade one in public primary school.

6. Duration of the investigation (years/months):

(Expected) start date: Between 20/5/2006 and 30/05/2007

(Expected) completion date: 30/05/2007

7. Sponsor:

University of Bahrain

8. Funding body (if applicable):

University of Bahrain

Status of proposal – if seeking funding (Please cross as appropriate):

i) in preparation ☐
ii) submitted ☐
iii) proposal accepted by funding body ☐
Date of submission of proposal

Date of commencement of funding Feb. 2005

9. Objectives of investigation:

Brief outline of the background, purpose and possible benefits of the investigation.

In Bahrain, many children enter primary school and move through the system without assessing their problems. Sometimes, teachers might think there is a problem, but they do not have an appropriate tool to detect the child's problem. Some children who fail in the same grade twice are shifted to a higher grade in order to provide a place for new children that join school. Some of these children might reach a grade in the educational system where they cannot continue through the system. One reason is their learning problems that were not recognised at early stage become more complicated learning problems. They withdraw from school at early age.

The purpose of this project is to develop a screening test for literacy and numeracy problems for children aged 5-6 before they enter school. This test will detect a child's problem and provide the class teacher with an idea about the child's present level on literacy and numeracy. For instance, the teacher will have information about the child phonological awareness, fine motor skill, and his strategy in counting.

The benefit of this test is to assist the class teacher to determine the present level of children in literacy and numeracy. The teacher could use this information in her future planning for each child. If the Ministry of Education in Bahrain uses this test at early stage, many children will get an appropriate support service at the appropriate time. This will decrease their emotional struggle and experience of failure. It will prevent the increase of the gap between these children's level and their peers. This research might help the class teacher to recognise some of the behaviour that children might use to cover their learning problems.

10. Nature of the participants:

Number: 100
Age (range): 5-7
Gender of volunteers: F/M
Recruitment method(s)
Two children from first grade and kindergarten class selected by the class teacher.
Inclusion/exclusion criteria (if appropriate)
The class teacher evaluation that these two children are lower attainers in literacy or numeracy or both
Screening procedure (if appropriate)
None
Any special skills, attributes, medical conditions
None
Any vulnerable participants (see Code of Practice, section 5.1(ii) and annex 2)
The participants are young children aged 5-7 who could not provide consent or approval
Themselves. I asked their parents to provide consent on their child's behalf.
Justifications for sample size (e.g. power calculations)
Power calculation was used in determining the sample size for the present research. In the absence of data in my research, I selected a probability of 80 in 100 of finding an effect. I plan to perform correlation test at alpha 0.05 to determine the sample size for this research. In the research of young children learning, the range of the effect size is 0.4 to 0.7. The total sample size required for attaining the probability of 80 in 100 of detecting an effect of 0.4 is 198 children and the total sample size required for attaining the probability of 80 in 100 of detecting an effect of 0.07 is 66 children (power tables in Cohen, 1988). The total sample size of 198 children might be too large from economical and ethical point of view. At the same time, it might be a risk to consider a high effect size such as 0.7 in behavioural sciences (effect size of 0.5 is recommended in Cohen, 1988). Bearing in mind such circumstances, I selected a total sample size of 100 for the probability of 80 in 100 of detecting the effect size of 0.4.
Will data be anonymised and destroyed after use? If not, please give reasons.
Yes.

11. What consents will be sought and how?

(Consent forms and participator information sheets (and questionnaires where used) must be appended to this application
.A letter from the school to children's parents (translation of this letter from Arabic to English is attached

12. Methodology

Design: what kind of design is to be used in the investigation (e.g. interview, experimental, observation, randomised control trial, etc.)?
Individual Interview/videotaped

Techniques: what methods will be employed and what exactly is required of participants?
* Please see attached interview schedule (after research questions).

Reference should be made to any of the following to be used in the investigation (see Code of Practice, section 5.1):

Invasive techniques ☐
DNA testing ☐
Administration of drugs, foods, liquids, additives, other substances ☐
Any deception ☐
Physical exertion/exercise ☐
Manipulation of cognitive or affective human responses, possibly causing stress/anxiety ☐
Highly personal, intimate and/or confidential information being sought ☐
Acquisition of bodily fluids or tissue ☐
Access to confidential data (e.g. medical reports) ☐
Description of the use of any of the above:

The duration of the study for participants and frequency of testing (if repeat testing is necessary)
Only once 30- 45 minutes)

13. Potential risks or hazards:

Full details should be given of any potential risks or discomfort for participants, any burdens imposed and any preparatory requirements (e.g. special diet, exercise), as well as any steps/procedures taken to minimize these risks and/or discomforts. Details should also be given of any potential risks to investigators.
None

14. Ethical issues

What do you consider to be the main ethical issues which may arise during the investigation, and how do you propose to address them (please refer in particular to Code of Practice, section 5.1)

This research deals with young children who could not make their own decision. In this case, it is important to consult other people such as children's parents, guardians and school administration.

15. Any payment to be made:
Include reference to reimbursements for time or expenses incurred, plus any additional fee/incentive for participation.
None

16. What debriefing, if any, will be given to volunteers?
None

17. What are the expected outcomes of the investigation? How will these be disseminated? Will you seek to publish the results?
I will develop a simple test that can be used by primary schools in Bahrain in order to detect young children's problems in literacy and numeracy at early stage. The result will be published in my PhD
How long will data (incl. e.g. photographs) be kept, and how will it be stored?
The data will be destroyed after I finish my PhD.

18. Nominated person (and contact details) to whom participants' concerns/questions should be directed before, during or after the investigation (in the case of student projects, both the supervisor (Ord 16 staff member) and the student should be named); in all cases a member of University staff should be named.
Supervisior Dr Penny Munn. PhD student:Amina Harmas Alhajeri

19. Previous experience of the investigator(s) with the procedures involved.
Supervisor: Extensive experience of research with children and clinical interview techniques.
: Student: I gained the experience of the test from the pilot study. Also, I have more than 14 years of professional working experience with young children.

20. Generic approval: if approval is sought for several separate investigations, or a series of investigations, all employing the same basic methodology and serving the same overall objective, then generic approval can be sought for a 3-year period. Give, on a separate sheet, further details about additional studies to be covered by this approval application, using the relevant headings (1-17 above), and drawing attention to any variations in methodology, participants, risks, etc. Student projects can also be submitted via Generic approval – see Code of Practice on Investigations on Human Beings, Section 6.3.

21. Sponsorship
This application requires the University to sponsor the investigation. I am aware of the implications of University sponsorship of the investigation and have assessed this investigation with respect to sponsorship and management risk. As this particular investigation is within the remit of the DEC and has no external funding and no NHS involvement, I agree on behalf of the University that the University is the appropriate sponsor of the investigation and there are no management risks posed by the investigation.
If not applicable, cross here

Signature of Head of Department ..... Please also print name below
Date:

22. **Declaration**

I have read the University's Code of Practice on Investigations on Human Beings and have completed this application accordingly.

Signature of Chief Investigator ..... Please also print name below

Signature of Head of Department ..... Please also print name below

Date:

* *

Notes

1. If there is any variation to any aspect of the investigation (location, investigators, methodology, risks, etc.) then the Secretary to the Ethics Committee should be notified in writing immediately.

2. Should anything occur during the project which may prompt ethical questions for any similar projects the Chief Investigator should notify the Ethics Committee.

3. Insurance and other approval requirements from appropriate external bodies must also be in place **before** the project can commence.

* *

For applications to the University Ethics Committee this completed form should be sent (electronically, with signed hard copy to follow) to Research and Innovation in the first instance.

2. Parent (Informed consent)

Date: _____

Dear Parent of_____

A scientific research will be conducted in the school and some children from grade 1 will be selected to participate in this project. The subject of this research is screening literacy and numeracy problems. During this process the child will be videotaped individually with the researcher in order to study the child's behaviour. The researcher would like to have your approval for the child participation. Please tick the appropriate box below and return this form to the administration office

I agree ☐

I do not agree ☐

Parent's signature

Thank you

Principal's office

Note: this letter is a translation from Arabic letter.

competence)? The evaluation must be based on diagnostic lists containing strong and weak points. It presents an alternative plan that uses strong points to prompt learning.

Article (4)

Procedures of evaluation process and conditions:

- The school is responsible for the learners' efficiency in all curriculum competences that are related and complementary in each round. Therefore, it is supposed that the school provides strategies and resources to evaluate learners in each round to identify their efficiency in the main competences.
- The teacher is responsible for his/her pupils' efficiency in main competences and other curriculum competences. He/ she ensures continuous development and improves each learners' learning and teaching.
- The evaluation process is continuous along with learning and teaching through its different stages from its beginning to the end including the correction process. Therefore, the teacher must apply norm-reference evaluation based on efficiency of the competences. This requires the teacher to use as fine a descriptive diagnosis as possible through the different stages of evaluation. The purpose of that is to identify strong elements that can be used to reinforce learning. On the other hand, it identifies weakness points that need improvement without judging learners during the learning process.
- The evaluation is comprehensive and includes several tools and strategies to ensure integral learning. It should identify advance skills such as problems solving, development of thinking strategies like the ability to draw conclusions and generalization. In addition, the evaluation should identify the learners' ability to follow rules and generalization to explain different tasks or situations and the ability to grasp complex relationships between causes and results.
- After each evaluation process, the class teacher cooperates with other teachers in the school to put a new plan that contains several alternatives (strategies, methods of learning, and teaching). This plan is based on learner's responses. Immediately, the teacher teaches the learners that did not perform skills efficiently. He/she must change his/her teaching strategies. In addition, he/she must ask the learners who did attain efficiency in competences to do advance activities in current competence.
- The teachers and the school should pay more attention to pupils with special needs. They must use various methods to raise their level of performance in as short period as possible.

- It is important to check and revise the learner's level of performance at the end of each round. The teacher must be sure of the learner's extent of acquiring the round objectives and his/her efficiency in attaining its competence before transfer to the next round.
- The school has accumulated records of each pupil that includes information about his health, social behavioural and academic achievement. The class teacher could benefit from this file in their future plan to provide each learner with his needs.
- The learner level of achievement is estimated on a diagnostic scale of competence. The teacher avoids comparing his level with his peers. This scale shows each learner's strong and weak points, and it replaces the grades. Therefore, the teacher must have portfolio of each learner.
- The teacher contributes with the school social worker to locate special need learners (gifted, slow learner, etc.) to provide them with their needs.
- The school and home share information about the learner. They cooperate to track the learner's performance, development, and find solutions for his problems.
- The teacher can coordinate with school head to make some changes in sequence of teaching curriculum content within the round.

Article (5)

- Teachers are supposed to use various evaluation strategies and methods to fulfil the requirement of each situation in order to estimate the learner's progress in various competences. They may use for instance:
- Frequent observation, planned activities, and individual initiated - group or individual project whether planned or not -written reports or research paper, test, and different assessment oral, written or practical.

Article (6)

- The transfer from one grade to another in the same round:
  - In the first and second grades, the teacher applies continuous formative evaluation to determine the learners who complete the required competences efficiency in order to move to upper grade. On the other hand, for those learners who did not reach minimal efficiency, the school determines reasons or each individual for not attaining this level through revising the whole year work. Then, these learners are transferred to the next grade. At the same time, the school provides each with a special program in the competence that he did not reach the required level of efficiency (particular emphasis on Arabic language and math). In addition to that, learners with learning problems (such as physical or mental) are transferred

to the higher grade, and the school provides them a remedy program adequate to their conditions. The school seeks support from counsellors in medicine, mental health, psychology, and social work.

Article (7)

- Transfer from one round to another.
  - At the end of grade 3, learners who complete the main competences of the first round especially Arabic language and maths are transferred to round two.
  - The procedure for the Evaluation of pupils competency at the end of grade 3 is as follows:
    - A committee of third grade teachers under supervision of the school head determines the learners who complete efficiency of main competence in Arabic language and maths, through continuous formative evaluation. They consider learners results in the summative complementary evaluation that all grade 3 learners perform.
    - The committee studies the evaluation folder of each learner who did not perform competence of Arabic language and maths in the first round at efficiency level. It consults the grade 3 teacher to describe the condition of each learner and the committee determines the learners that could transfer to the second round.
    - For the learners who did not reach the level that allow them to be transferred to grade 4, it is determined that they repeat grade 3 the following year, and the school puts more emphasis on weak points, particularly in the main two subjects mentioned above. Each learner is provided with a program that is adequate to his needs, and the school continuously follows up his progress and shares responsibility with parents.

Article (8)

Evaluation of the learner's level of accomplishment and explain the results.

- In continuous diagnostic formative evaluation, teachers use diagnostic lists and a portfolio to determine the learner's performance and efficiency in the main competences in each subject. Then, they state the strong and weak points in his performance, and describe his location on the developmental scale in order to help to improve his function.

Article 9

Upgrading children

According to Ministerial decision dated 11/11/1984:

- It is possible to upgrade new registered children directly to the second grade if they fulfil the conditions stated in article (2) from this decision.
- Conditions that are required for upgrading children are mentioned in article (1):

1. A child's guardian (parent) has to register his child who fulfils the required conditions of registration to grade (1) in the school that he likes to enrol his child in and presents all documents required for acceptance in grade 1.
2. A child's Guardian writes a request to the primary school administration in the first week of September to explain his interest in enrolling his child in grade 2 instead of grade 1. He must present with his request, the following:
   a) Proof that his child is not less than six years and six months in the beginning of the new academic year.
   b) Registration form from the school where he has registered his child.
3. The child has to pass the test on Arabic language and maths primary skills organized by the evaluation unit in the curriculum department (in the Ministry of Education).
4. During the first week of October, the administration of primary education informs primary schools of the names of children that are supposed to be upgraded.

Article (10)

General rules:

- Repeating a level or a grade

  Teachers have to present explanatory reports about the learner who remains in the same grade for two sequential years. They are supposed to indicate the reasons for his/her failure. Then, a committee of teachers from different subjects that teach the learner are gathered with the school social worker under the school principal's supervision to take an appropriate decision on each case.
- It is against the regulation to exempt pupil less than 15 years old from school due to repeated failure.

Appendix: (3) Test

Screening test to identify children age 5-7 at risk of learning problems in the Kingdom of Bahrain

Prepared by

Amina Alhajeri

Child name: _____, Date of birth: _____

School name: _____, Area: _____

Future primary school name: _____, Date of the assessment_____

The purpose of this test is to identify Arabic children age 5-6 in Bahrain who might be at risk of learning problems in literacy and numeracy. The test contains three parts:

Part one: The Reading test

The reading test focus is on the phonological awareness as a predictor for literacy deficiency and the concepts of print.

■ **Phonological awareness**

This section consists of four tasks and each task contains 6 items. Then, each item is formed of 3 pictures of familiar objects and the child is asked to:

1. Say the initial sound in the word of the object's picture provided.
2. Say the common initial sound in two (objects' pictures) of the three words provided.
3. Say the common sound at the end of two (objects' pictures) of the three words provided.
4. Say the longer word (object's picture) of the three words provided. The longer word is the one that have one of the three long vowels. So, the child is expected to separate the long vowel from the short ones (markers).

It is important to mention that the researcher tried to include almost all the Arabic language sounds (28 letters) with the six vowels and the first item of the four tasks is just an example.

■ **Concepts of the print**

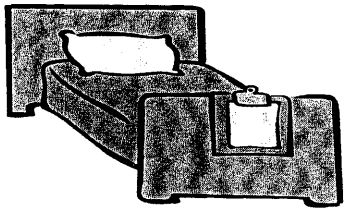
In this section, the researcher used two Arabic story's books that are appropriate for the children age group. The child is asked to hold and open one of the story's books and he/she is expected to:

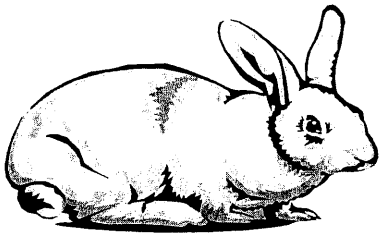
- Show the beginning of the story (the text from right to left).
- Point to any letter or particular letter, a word (count the words in the sentence).

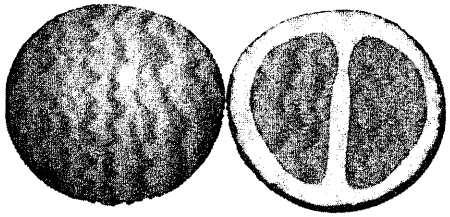
First Part: Literacy Test

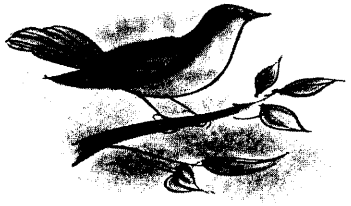
Section one: Phonological awareness

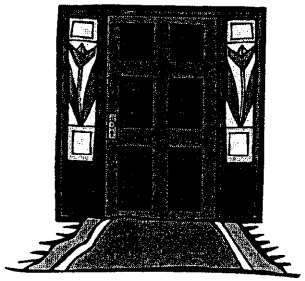
Task 1: Say the first sound in each object

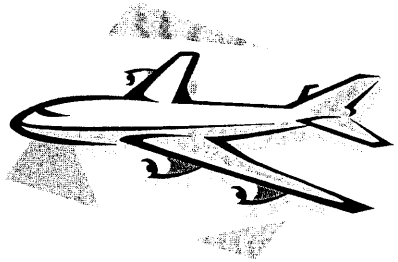


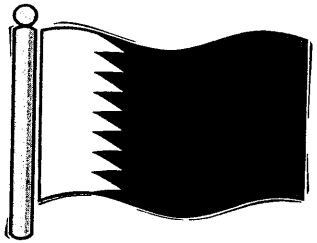




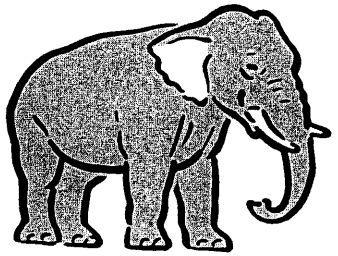


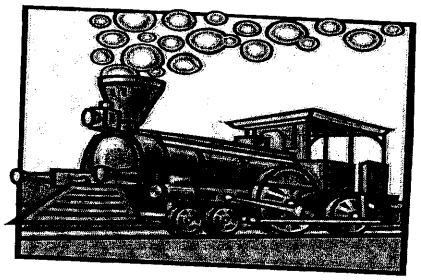


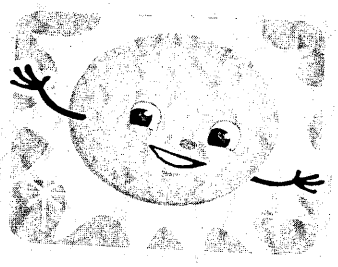


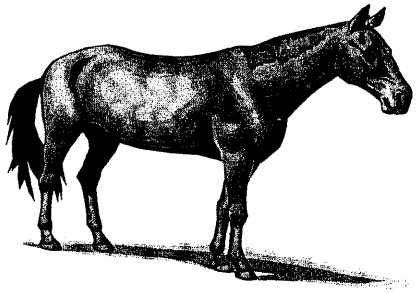




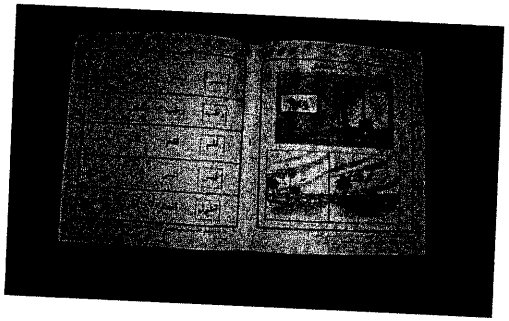






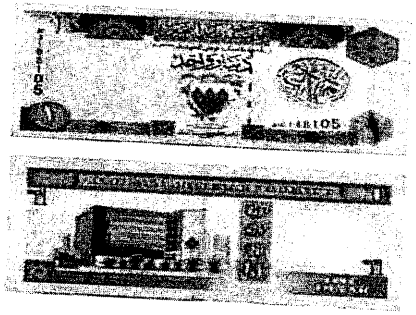






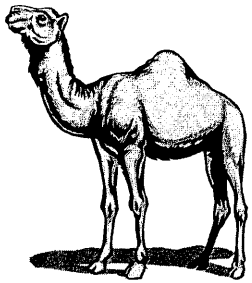


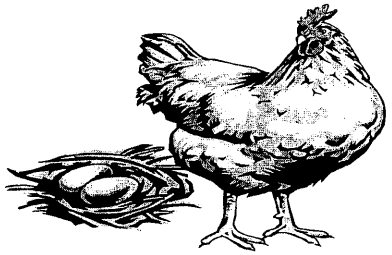


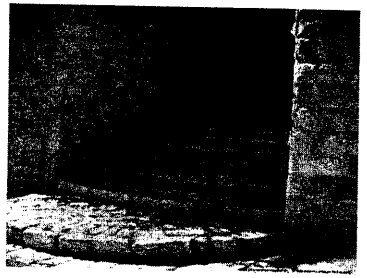




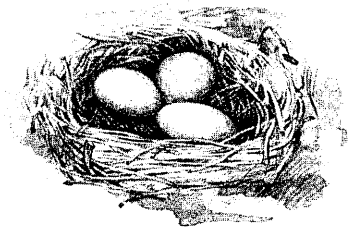
Task: 2 These are three objects, only two of them begin with the same sound, name the two objects and the common sound?

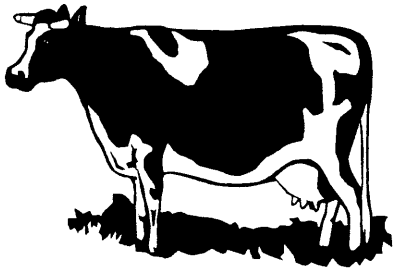




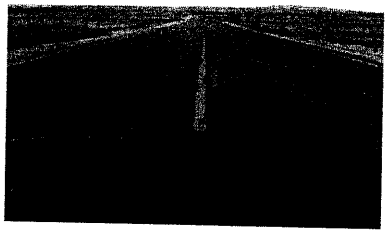


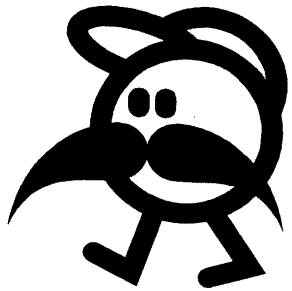


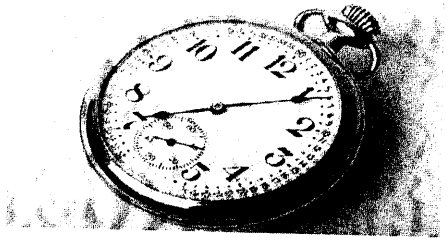




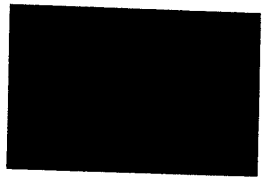


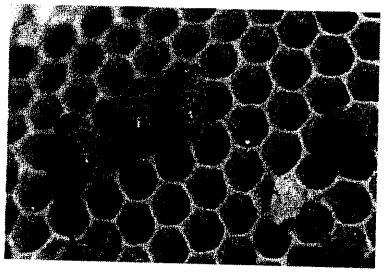


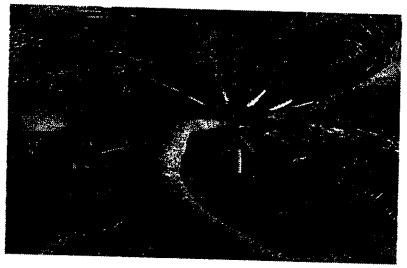


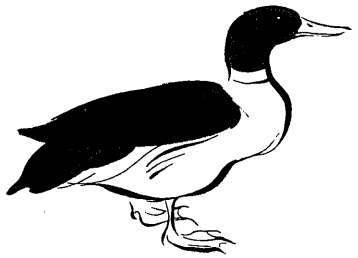


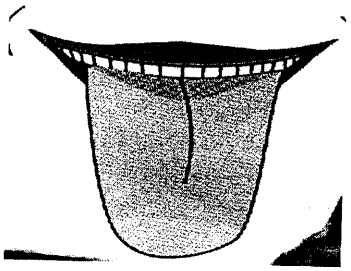




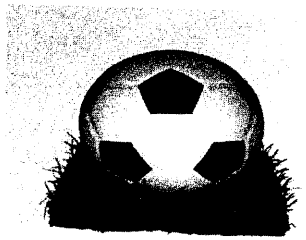




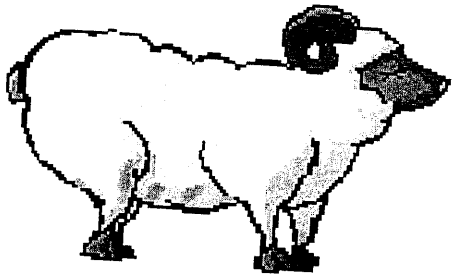
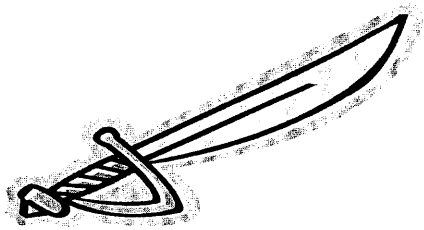
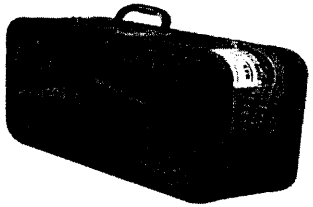


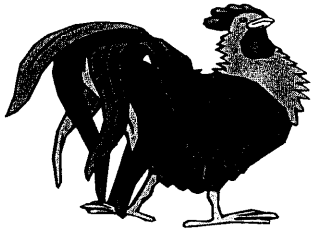
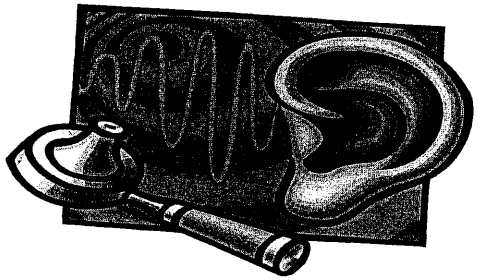
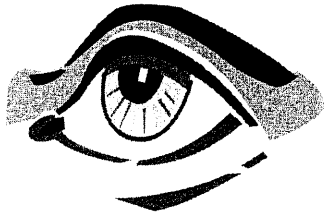






Task 3: These are three objects, only two of them end with the same sound; name the two objects and the common sound?

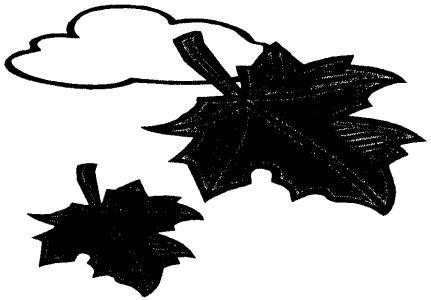





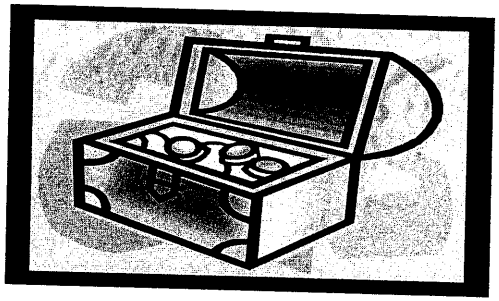





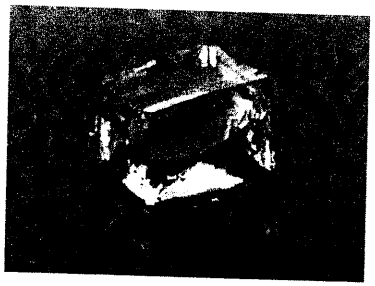


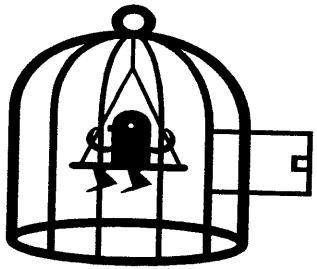


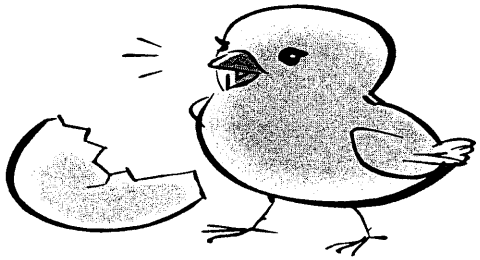


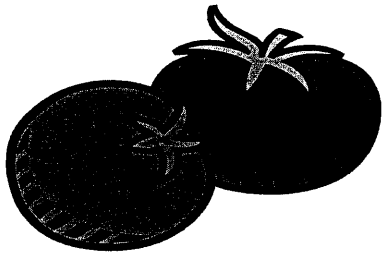












Part two: Writing test

The writing test consists of two tasks:

- On the first task, the child is instructed to draw his favourite person and make some comments on the drawing. Then, he is asked to write them down in his own words. At the end, the child is asked to write his/her name on the drawing.
- On the second task, the researcher puts in front of the child one at a time a circle, square, triangle and diamond shapes in the same sequence. Then, the child is asked to draw each one.

Drawing of the favourite person

Copying four shapes

Part three: Mathematics test

The tasks in the Mathematics test are borrowed from Mathematics Recovery Assessment (Wright, 1992). The researcher selected the arithmetic tasks only. In these tasks, two screens papers and some counters are used. The test composes of:

1. Entry task:
   The researcher covers five counters with one screen and four counters with the other screen. She administrates this procedure quickly to avoid the child counting. Then, the child is asked to say how many counters are there altogether. After that, the researcher removes the screens and let the child check his answer. The same procedure is performed with nine and six counters. If the child was successful in these tasks, he moves to more advanced task, whereas, the child who finds it difficult is asked to move back to less advanced task.
2. Less advanced task.
   On this task, the, I used one screen only to cover the first group of counters. I put 5 counters in front of the child and cover them. Then, I put 2 counters visible. After that, I asked the child how many counters are there altogether. Then, I allowed the child to check his answer. Next, I did the same with seven and five counters. If the child was not able to perform this task, I administrate the same ask with no screening. If the child still cannot do the task, I moved to one and one correspondence tasks. She arranges 13 counters in a snake shape, and asks the child to count them and say how many counters are there. She does the same with 18 counters. However, the child who was successful in task one, will move on to the more advanced task.
3. More advanced tasks
   The researcher uses the two screens and follows the same procedure as in the entry task. First, she puts eight and five counters; and nine, three counters. If the child was not able to do this task, he drops back to the less advanced task. Then, she ends the interview. However, the child who performed the task successfully moves on to missing addends.
4. Missing addends
   On this task, one screen is used. The researcher puts in front of the child 4 red counters and covers them. Then, she asks the child to look away and adds 2 white counters. Then, she says to the child that when he was looking away, she added some white counters. Next, she

says to him, the number of screened counters becomes 6. After that, she asks him how many white counters are added. Then, she let the child check his answer. Moreover, the same procedure is followed with 12 red counters and the added 3 white counters. The total number of counters is 15. The child is asked to figure the number of the white added counters.

Appendix (4)

Procedure for additive tasks (Math Recovery)

1. Introduction (use two screens)

Say: There are 3 counters under here and 2 counters under here. How many are there altogether? (Wait time). Remove the screen and allow the child to check his/her answer.

2a) Entry task (use two screens)

Say: There are 5 counters under here and 4 under here. How many are there altogether? Remove the screens and allow the child to check his/her answer.

Say: There are 9 counters under here and 6 counters under here. How many are there altogether? Remove the screens and allow the child to check his/her answer.

If the child said I do not know or tried to guess, drop back to (1b) and finish the interview there. If the child answers were correct or tried and got some correct others wrong, the child move to (1c).

1b) less advanced task (screen only the first collection)

Say: There are 5 counters under here and 2 counters over here. How many are there together? Remove the screen and allow the child to check his/her answer.

Say: There are 4 counters under here and 3 counters over here. How many are there altogether? Remove the screen and allow the child to check his/her answer.

Say: There are 7 counters under here and 5 counters over here. How many are there altogether? Remove the screen and allow the child to check his/her answer.

If the child cannot manage this, repeat the tasks at 1b) without any screens at all. If the child cannot manage unscreened addition, then check one to one correspondence

Make a snake of 13 counters and say: Would you count to see many there are here? - Make a snake of 18 counters and say: Would you count to see how many there here?

1c) More advanced tasks (use two screens)

Say: There are 8 counters here and 5 counters under here. How many are there altogether? Remove the screens and allow the child to check his/her answer.

Say: There are 9 counters here and 3 counters under here. How many are there altogether? Remove the screens and allow the child to check his/her answer.

- Missing addends (use one screen) Show the child 4 Red counters and screens them. Now I have red counters under here- would you look away for a minute while I put some white counters under here? While the child is looking away, add 3 White counters to the 4 ones. You can look back now. While you were looking away, I put some white counters under here with those 4 red counters and now there are 6 counters here altogether. How many white counters did I add? Remove the screen and allow the child to check his/her answer.

Show the child 12 Red counters, and screens them. Now I do have 12 red counters here – would you look a way for a minute while I put some white counters under here? While the child is looking a way, add 3 White counters to the 12 red ones. You can look back now. While you were looking away, I put some white counters under here with those 12 red counters and now there are 15 counters here altogether. How many white counters did I add? Remove the screen and allow the child to check his/her answer.

If the child has not done particularly well on 1c), the more advanced additive tasks, then you should drop back to 1b) the less advanced additive tasks, to gain more information on his/her strategies.

Appendix (5)

1. Ethics (a copy of the application form sent to the ethics committee in the University of Strathclyde)

UNIVERSITY OF STRATHCLYDE

APPLICATION FORM FOR UNIVERSITY ETHICS COMMITTEE AND DEPARTMENTAL ETHICS COMMITTEES

This form applies to all investigations within the remit of the University's Code of Practice on Investigations on Human Beings. This includes all investigations with human participants undertaken by staff or students of the University of Strathclyde which falls within the remit of the University Ethics Committee (see Code of Practice, para 5.1) or the Departmental Ethics Committees (see Code of Practice, para 5.2). However, this form should NOT be used for any investigation involving clinical trials (see Code of Practice, para 6.4) or medicinal products, nor for investigations involving staff, patients, facilities, data, tissue, blood or organ samples from the National Health Service. Applications for ethical approval for investigations involving the National Health Service in any way must be made under the governance arrangements for National Health Service Research Ethics Committees (see Code of Practice, para 3.2(d)) and where ethical approval is required from the NHS using the form issued by COREC (see Code of Practice, para 6.1).

Information sheets for volunteers and consent forms to be used in this study should be submitted with the application form for consideration by the Committee.

The application will be judged entirely on the information provided in this form and any accompanying documentation - full grant proposals to funding bodies should not be attached. Please explain any abbreviations, acronyms etc that you use. The Code of Practice (http://www.mis.strath.ac.uk/Secretariat/Ethics.htm) contains guidance on completing this application, on information sheets and on consent forms.

Applications which are not signed and/or do not include the required additional forms (e.g. participant information sheet and consent form) will not be considered by the University Ethics Committee and will be referred back to the Chief Investigator.

The form is designed for completion in Word, and should in any case be typed rather than handwritten. The grey-shaded text boxes on the form will expand to allow you to

enter as much information as you require. If you have difficulty filling out the form in Word, please contact Fiona Campbell in the Secretariat **(ext. 2101).**

Checklist of enclosed documents

Document	Enclosed?	N/A
Participant information sheet(s)	☐	☐
Consent form(s)	☒	☐
Sample questionnaire(s)	☐	☐
Sample interview format(s)	☒	☐
Sample advertisement(s)	☐	☐
Any other documents (please specify below)	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐

1. Chief Investigator **(for the purposes of this application, this should always be the person responsible for the study at Strathclyde)**

Name: Dr Penny Munn

Status (e.g. professor, senior lecturer): Reader

Department: Childhood and Primary Studies/Education

Contact details: Telephone: (77)3746

E-mail: "Penelope Munn" <penelope.munn@strath.ac.uk>

2. **Other Strathclyde Investigator(s)**

Name(s): Amina Harmas Alhajeri

Status (e.g. lecturer, post-/undergraduate): PhD student.

Department(s): Childhood and Primary Studies/Education

If student(s), name of supervisor: Dr Penny Mun

Contact details: Telephone: 7979737787

E-mail: Amina Alhajeri@strath.ac.uk

Please provide details for all investigators involved in the study (*the text box below will expand to allow details to be entered*):

3. **Non-Strathclyde collaborating investigator(s)**

Name(s): None

Status:

Department/Institution:

If student(s), name of supervisor:

Contact details: Telephone:

E-mail:

Please provide details for all investigators involved in the study (*the text box below will expand to allow details to be entered*):

4. **Title of the investigation**:

Screening literacy and numeracy problems at age 5-6 before school entry at in Bahrain

5. **Where will the investigation be conducted? (Note that the Committee reserves the right to visit testing sites and facilities)**

In the Kingdom of Bahrain/ kindergraten and grade one in public primary school.

6. **Duration of the investigation (years/months):**

(Expected) start date: Between 20/5/2006 and 30/05/2007

(Expected) completion date: 30/05/2007

7. **Sponsor:**

University of Bahrain

8. **Funding body (if applicable):**

University of Bahrain

Status of proposal – if seeking funding (Please cross as appropriate):

i) in preparation ☐
ii) submitted ☐
iii) proposal accepted by funding body ☐
Date of submission of proposal

Date of commencement of funding Feb. 2005

9. **Objectives of investigation:**

Brief outline of the background, purpose and possible benefits of the investigation.

In Bahrain, many children enter primary school and move through the system without assessing their problems. Sometimes, teachers might think there is a problem, but they do not have an appropriate tool to detect the child's problem. Some children who fail in the same grade twice are shifted to a higher grade in order to provide a place for new children that join school. Some of these children might reach a grade in the educational system where they cannot continue through the system. One reason is their learning problems that were not recognised at early stage become more complicated learning problems. They withdraw from school at early age.

The purpose of this project is to develop a screening test for literacy and numeracy problems for children aged 5-6 before they enter school. This test will detect a child's problem and provide the class teacher with an idea about the child's present level on literacy and numeracy. For instance, the teacher will have information about the child phonological awareness, fine motor skill, and his strategy in counting.

The benefit of this test is to assist the class teacher to determine the present level of children in literacy and numeracy. The teacher could use this information in her future planning for each child. If the Ministry of Education in Bahrain uses this test at early stage, many children will get an appropriate support service at the appropriate time. This will decrease their emotional struggle and experience of failure. It will prevent the increase of the gap between these children's level and their peers. This research might help the class teacher to recognise some of the behaviour that children might use to cover their learning problems.

10. Nature of the participants:

Number: 100
Age (range): 5-7
Gender of volunteers: F/M
Recruitment method(s)
Two children from first grade and kindergarten class selected by the class teacher.
Inclusion/exclusion criteria (if appropriate)
The class teacher evaluation that these two children are lower attainers in literacy or numeracy or both
Screening procedure (if appropriate)
None
Any special skills, attributes, medical conditions
None
Any vulnerable participants (see Code of Practice, section 5.1(ii) and annex 2)
The participants are young children aged 5-7 who could not provide consent or approval
Themselves. I asked their parents to provide consent on their child's behalf.
Justifications for sample size (e.g. power calculations)
Power calculation was used in determining the sample size for the present research. In the absence of data in my research, I selected a probability of 80 in 100 of finding an effect. I plan to perform correlation test at alpha 0.05 to determine the sample size for this research. In the research of young children learning, the range of the effect size is 0.4 to 0.7. The total sample size required for attaining the probability of 80 in 100 of detecting an effect of 0.4 is 198 children and the total sample size required for attaining the probability of 80 in 100 of detecting an effect of 0.07 is 66 children (power tables in Cohen, 1988). The total sample size of 198 children might be too large from economical and ethical point of view. At the same time, it might be a risk to consider a high effect size such as 0.7 in behavioural sciences (effect size of 0.5 is recommended in Cohen, 1988). Bearing in mind such circumstances, I selected a total sample size of 100 for the probability of 80 in 100 of detecting the effect size of 0.4.
Will data be anonymised and destroyed after use? If not, please give reasons.
Yes.

11. What consents will be sought and how?

(Consent forms and participator information sheets (and questionnaires where used) must be appended to this application
.A letter from the school to children's parents (translation of this letter from Arabic to English is attached

12. Methodology

Design: what kind of design is to be used in the investigation (e.g. interview, experimental, observation, randomised control trial, etc.)?
Individual Interview/videotaped

Techniques: what methods will be employed and what exactly is required of participants?
* Please see attached interview schedule (after research questions).

Reference should be made to any of the following to be used in the investigation (see Code of Practice, section 5.1):

Invasive techniques ☐
DNA testing ☐
Administration of drugs, foods, liquids, additives, other substances ☐
Any deception ☐
Physical exertion/exercise ☐
Manipulation of cognitive or affective human responses, possibly causing stress/anxiety ☐
Highly personal, intimate and/or confidential information being sought ☐
Acquisition of bodily fluids or tissue ☐
Access to confidential data (e.g. medical reports) ☐
Description of the use of any of the above:

The duration of the study for participants and frequency of testing (if repeat testing is necessary)
Only once 30- 45 minutes)

13. Potential risks or hazards:

Full details should be given of any potential risks or discomfort for participants, any burdens imposed and any preparatory requirements (e.g. special diet, exercise), as well as any steps/procedures taken to minimize these risks and/or discomforts. Details should also be given of any potential risks to investigators.
None

14. Ethical issues

What do you consider to be the main ethical issues which may arise during the investigation, and how do you propose to address them (please refer in particular to Code of Practice, section 5.1)

This research deals with young children who could not make their own decision. In this case, it is important to consult other people such as children's parents, guardians and school administration.

15. **Any payment to be made:**
Include reference to reimbursements for time or expenses incurred, plus any additional fee/incentive for participation.
None

16. **What debriefing, if any, will be given to volunteers?**
None

17. **What are the expected outcomes of the investigation? How will these be disseminated? Will you seek to publish the results?**
I will develop a simple test that can be used by primary schools in Bahrain in order to detect young children's problems in literacy and numeracy at early stage. The result will be published in my PhD
How long will data (incl. e.g. photographs) be kept, and how will it be stored?
The data will be destroyed after I finish my PhD.

18. **Nominated person (and contact details) to whom participants' concerns/questions should be directed before, during or after the investigation (in the case of student projects, both the supervisor (Ord 16 staff member) and the student should be named); in all cases a member of University staff should be named.**
Supervisior Dr Penny Munn. PhD student:Amina Harmas Alhajeri

19. **Previous experience of the investigator(s) with the procedures involved.**
Supervisor: Extensive experience of research with children and clinical interview techniques.
: Student: I gained the experience of the test from the pilot study. Also, I have more than 14 years of professional working experience with young children.

20. **Generic approval:** if approval is sought for several separate investigations, or a series of investigations, all employing the same basic methodology and serving the same overall objective, then generic approval can be sought for a 3-year period. Give, on a separate sheet, further details about additional studies to be covered by this approval application, using the relevant headings (1-17 above), and drawing attention to any variations in methodology, participants, risks, etc. Student projects can also be submitted via Generic approval – see Code of Practice on Investigations on Human Beings, Section 6.3.

21. **Sponsorship**
This application requires the University to sponsor the investigation. I am aware of the implications of University sponsorship of the investigation and have assessed this investigation with respect to sponsorship and management risk. As this particular investigation is within the remit of the DEC and has no external funding and no NHS involvement, I agree on behalf of the University that the University is the appropriate sponsor of the investigation and there are no management risks posed by the investigation.
If not applicable, cross here

Signature of Head of Department ..... Please also print name below
Date:

22. Declaration

I have read the University's Code of Practice on Investigations on Human Beings and have completed this application accordingly.

Signature of Chief Investigator ..... Please also print name below

Signature of Head of Department ..... Please also print name below

Date:

* *

Notes

1. If there is any variation to any aspect of the investigation (location, investigators, methodology, risks, etc.) then the Secretary to the Ethics Committee should be notified in writing immediately.

2. Should anything occur during the project which may prompt ethical questions for any similar projects the Chief Investigator should notify the Ethics Committee.

3. Insurance and other approval requirements from appropriate external bodies must also be in place **before** the project can commence.

* *

For applications to the University Ethics Committee this completed form should be sent (electronically, with signed hard copy to follow) to Research and Innovation in the first instance.

2. Parent (Informed consent)

Date: _____

Dear Parent of_____

A scientific research will be conducted in the school and some children from grade 1 will be selected to participate in this project. The subject of this research is screening literacy and numeracy problems. During this process the child will be videotaped individually with the researcher in order to study the child's behaviour. The researcher would like to have your approval for the child participation. Please tick the appropriate box below and return this form to the administration office

I agree ☐

I do not agree ☐

Parent's signature

Thank you

Principal's office

Note: this letter is a translation from Arabic letter.