

INFLUENCES ON PUPILS' PROGRESS  
IN RECEPTION CLASSES IN TAIWAN:  
A QUALITATIVE STUDY

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## **DECLARATION**

**I hereby declare that the work presented in this thesis was composed and conducted by myself. None of the work included has been submitted for publication nor in support of another degree or professional qualification.**

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## ABSTRACT

This exploratory study has used qualitative research methodologies and strategies to identify influences on pupils' progress after starting formal schooling in Taiwan. The thesis sets the study in the educational and social setting of Taiwan, and indicates the particular difficulties and constraints affecting primary teachers and pupils in reception classes. These difficulties include an unrealistic, centrally imposed and rigidly enforced curriculum, large classes, traditional teaching methods, and the use of a language of the teacher's instruction and a phonetic system of learning to read, which are both unfamiliar to many pupils entering school.

Research into school readiness and related topics is reviewed, concluding that the quantitative methodologies adopted and the contexts investigated provide little indication of how to proceed with this particular study. A pilot study was used to identify issues, and to decide whether qualitative methods could be used to collect appropriate data to investigate those issues. This pilot study was supplemented by an analysis of the use of qualitative methodologies to decide on the specific methodologies to be used in the main study.

It was decided to draw on a combination of interviews, observations and content analysis to collect the data. Data was collected from four reception classes (two each from working class and middle class areas) out of which 36 children were selected from those children identified as having substantial difficulties (N=28) and those progressing well (N=8). The parents of these children were interviewed about their children's experiences and asked to provide explanations for the progress being made at school. Analyses of these interviews, combined with parallel comments made by the four teachers, indicated those aspects of home conditions and children's abilities and personality considered to influence progress.

Interviews with teachers, combined with observations of the way they presented the tasks to their class, enabled distinctive differences between them to be described. These differences could subsequently be used to explain, in part, differences in progress. Interviews with pupils, in conjunction with an examination of their class work to identify errors and specific forms of difficulty, enabled the pupils' class behaviour and performance to be explained in terms of the interaction of their own characteristics and home background with the ways in which the teachers had introduced the topic. Qualitative analysis does not provide firm evidence of the relative strength of these effects, but it was clear that one teacher who explained the tasks more fully was enabling even pupils of weaker ability to perform optimally and make progress. Case studies of four of these interactions were used to illustrate the effects observed and to lead into a discussion of the implications for reception class teaching in Taiwan.

The conclusion is that a lack of cognitive ability and language competence were commonly observed as associated with poor progress, and indeed some of these pupils seemed to have insuperable problems in the current system. The imposition of a curriculum with the same time pressures being put on all pupils, irrespective of their ability and readiness for school, created great difficulties for teachers and pupils alike. But some teachers exacerbated this problem by failing to provide adequate explanations and rehearsals of tasks for the slower pupils or those with language problems. The tasks themselves were often boring and old fashioned, lacking interest or appeal for the pupils. Initial difficulties often created hostile attitudes to school and a downward spiral in effort and achievement. Finally, the thesis attempts to suggest realistic and practical remedies for what seems to be a wholly unsatisfactory situation.

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## CHAPTER 1

### Introduction

This introductory chapter is designed to set the stage for the empirical work on which this research was based. The chapter therefore begins with brief descriptions of the nature of the information used in each chapter and is followed by an introduction to the general social background, and the educational system, in Taiwan.

Although there are many well-recognised differences in cultural, social and linguistic aspects, there are similarities of the ways of thinking on which research disciplines are based between Taiwan and the West. The research done in the West has provided insight into the present development of research in an area which is in its infancy in Taiwan. Based on the main concern which is about the progress made when children start school, literature will be reviewed in Chapter 2 in four areas: child development and educational ideals, school readiness, academic tasks and learning, and learning in the subjects of language and mathematics. The best way of following children's progress in empirical terms is through a qualitative approach which enables the whole context to be reviewed. Qualitative methodologies and strategies for educational research will be discussed in Chapter 3.

It is necessary to identify the significant and crucial aspects which best represent the reality of the progress children make when they start school from the perspectives of the interactions between the situation, the individuals and the outcomes. It is also necessary to conduct a pilot study to ascertain the relevance and the appropriateness of the qualitative methods used to obtain the required information. The findings of the pilot study will be presented in Chapter 4.

In Chapter 5 there is a presentation of a specific research rationale for planning and implementing the fieldwork of the main study. This is based on the findings and implications of the pilot study. The results of the main study will be presented in the following order - the characteristics of the children, the immediate contexts in which classroom instruction take place and the academic materials which the teachers and children have to use. The difficulties children encountered in performing the required tasks will be the themes of Chapters 6, 7 and 8.

In a qualitative study, its strength depends on the presentation of case studies which illustrate the whole context. Here the crucial illustration is of interactions between teachers, children and tasks. Chapter 9 will therefore introduce representative cases to stress the effects of individual differences, teaching methods and tasks, in interaction as they affect children's progress. The final chapter will end with discussions which synthesise the findings of the pilot study and the main study. Realistic and practical suggestions about ways to improve the situation for children entering school will also be made.

## 1.1 Background on Taiwan

The current political situation has confused the world-wide opinion about Taiwan since World War II. On the one hand, Taiwan is too small to warrant attention in geographical terms, yet, on the other hand, her economic development and achievement has been too vigorous to be ignored. For economic prosperity, Taiwan has been fully acknowledged as one of the best models for the developing countries.

Taiwan's experience is of rags to riches. Average income is reckoned to be about \$10,000 a year, when the black economy is counted in. Mainland China's is \$300 a year. Taiwan is about level with Japan as the country with the largest reserves of foreign currency, \$69 billion, and has the agreeable problem of what to do with them. (The Economist, 2-8 June, 1990, p.67)

However, Rome was not built in a day, and neither was Taiwan. Having been part of China for centuries, it remains Chinese historically and culturally. The Chinese heritage is embodied in many significant and crucial aspects, such as educational ideals and practices. It is therefore necessary to present a brief historical and cultural analysis of Taiwan before proceeding to introduce its educational system.

Taiwan had been a colony of Japan from 1895 to 1945 as a result of the treaty signed by the Ching Dynasty in response to the loss of the Sino-Japanese War. A civil war between the Nationalist Government and the Communist armies took place during World War II. The Nationalist Government led by Chiang Kai-shek was defeated and soon retreated to Taiwan in 1949.

As Chaffee et al. (1969) reviewed, Japanese colonisation had led Taiwan to have early contacts with western industrialisation and this moved its modernisation on a course different from that in mainland China. On the other hand, the Japanese made Japanese the official language of the island and set up economic systems in which Japanese held all the significant governmental and industrial posts. Only a few Taiwanese gained access to training as civil servants. The overthrow of the Ching Dynasty, the last empire of China, and the establishment of the Republic by Sun Yat-sen, seemed to be irrelevant events to the people of Taiwan.

However, having been a colony of Japan for fifty years had not changed the basic structures of the Taiwanese family and 'ethnocentrism' of Chinese culture.

The preservation of the traditional family system, in which several nuclear families were grouped around a compound with the hierarchy of authority extending downward from the eldest to the youngest male, suited the desire of the Japanese to control since each family could be held responsible for the misdemeanors of its individual members. (Chaffee, et al. 1969, p.2)

At the end of the 19th century, imperial China underwent the process of industrialisation and encountered foreign trade as a result of responses to the military invasion by western countries and the influences of their cultures (Chaffee, et al., 1969). There is one main traditional influence which has enabled the modernisation of Taiwan to take place smoothly, that is, the strong tradition of family relationships illustrated by Confucius (Hsu, 1967), stressing close kinship ties, veneration of elders and filial piety for parents.

From the beginning of modernisation in Taiwan, there seems to have been no crucial changes occurring in the interpersonal relationships within the family (Hsu, 1981). Although great changes in socio-economic conditions and technical household facilities have led the roles within the family to undergo a marked change, the feeling about the family and its functions, by and large, remains the same. The authority and influence of the parents on the children are still strong. The family is the foremost source of economic, psychological and emotional support for the children. Parents' expectations of children's success exert great pressure and also provide a strong incentive to children's diligence in significant dimensions of life, and this is particularly evident in the middle-class family. Also many illiterate low-SES-class parents push their children to work hard at school in

order to be upwardly mobile, even though they fail to offer substantial and helpful guidance.

Generally speaking, Chinese behaviour and attitudes reflect the interactions of individuals in the framework of the community and of the kinship organisation (Hsu, 1981). Many treasured traditional patterns of behaviour, such as the sustenance of personal relations, act as potent forces, not only in the development of an individual's well-being, but also in the wider sense of industrialisation and urbanisation of Taiwan. Close family relationships narrow the social and geographical distances among the family members (Chaffee et al. 1969). Communal ties, based on kinship relations, turn out to be adaptable to the new conditions of modern society. This is rooted in conventional Confucianism of inter-individual relationships (Hsu, 1981). This kind of Chinese family structure actively stimulates movement towards development rather than acting as a blockade to changes in the individual, society, and country (Wang, 1981).

The Republic of China, as Taiwan calls itself (as opposed to the People's Republic of China of the mainland), unilaterally claims to be the legitimate ruler of the entire country. However, Taiwan is virtually independent of mainland China since the Communists took over <sup>mainland China</sup> in 1949. Direct contact made by the people of Taiwan with those living in mainland China were treated as treason until martial law was lifted in Taiwan in 1986. Ironically, the people of mainland China are still not permitted to visit Taiwan. Hostility, rooted in military defeats and ideological conflicts between the Nationalist and Communist parties, has created barriers to reunions and communications between families and friends on both sides.

The government in Taiwan controls only one of many provinces of China - the province of Taiwan and a few small islands. Taiwan has a population of nearly 20 million living in an area amounting to 36,000 km<sup>2</sup> in total. The island of Taiwan is situated about 115 miles off the southern coast of mainland China. Politically speaking, Taiwan is the direct descendant of the first Republic set up by Sun Yat-sen in 1912 and the Nationalist Government in Taiwan continues to hold on to his ideas. Over time, Sun's opinions on political development in China as a whole have become unchallengeable grounds for the monopolising political interest of the Nationalist party and also for the political socialisation of ordinary people along doctrinaire lines through all available means, particularly education and the mass

media. Children at very early age at school develop an awareness of certain national symbols, patriotism and anti-communism, paying special attention to Chinese Communists in absolute terms.

Before World War II, apart from a small number of aborigines, whose ancestors lived on the island centuries before the beginnings of Chinese migration, the population consisted of the descendants of Chinese from the southern provinces of Fukien and Kwangtung on the mainland who had arrived in the island in the 16th century (see Chaffee et al., 1969). In 1949, about 2 million Chinese fled from the mainland to the island. These mainlanders were high-ranking Nationalist government officials, intellectuals, and a military force who still form the mainstream of the leadership. The population of Taiwan now consists of approximately 98.5 percent Chinese, the remainder being the aborigines.

Vast lands, inconvenient communication and poor transportation in ancient times in China brought about numerous dialects in the Chinese spoken languages over the centuries. The major dialects are Cantonese, Kan, Hakka, Minan, Wu, Hsiang, and Northern, Southern and Southwestern Mandarin. The Peking dialect was given the name Mandarin by the West because it had been the speech of civil servants in government offices since the Republic. The dialects of Minan and Hakka survive and thrive among the Taiwanese whose ancestors migrated from the southern provinces to the island in the early 17th century (Ho, 1986). They use a common written language, although the different spoken dialects are mutually incomprehensible.

A variety of pronunciations across different dialects had been thought to hamper the unification and progress of the nation so the Nationalist Government formulated a national phonetic system as a standard vernacular soon after the retreat to Taiwan. Selected from 39 symbols and 5 tone marks, 37 symbols and 4 tones were finally officially adopted. Mandarin, is the norm underlying this national phonetic system called Pinyin which is taught regularly in primary schools. Nowadays, almost all average-educated young people can speak Mandarin as a result of forty-year efforts and the influence of the National Language Movement. As far as Chinese written characters are concerned, the writing system was not unified until the unification of the whole country by Chin Shih Huang (the first emperor of imperial China), who decreed a uniform system of

characters. However, there is no need here for a detailed description of the evolution of the writing system of the Chinese language.

In essence, the Chinese language is a branch of the Sino-Tibetan language, one of the largest language families in the world (Ho, 1986; Kenneth, 1986). The vast majority of Chinese use the language of the Sino-Tibetan families whereas the minority in China use the Tai, Mongolian, Turkic, Tibeto-Burman, and Austronesian languages (Ho, 1986). Therefore, the Chinese language is a tonal language, that is, different tones distinguish words that are sounded identically. Every Chinese syllable essentially has a distinctive pitch pattern called tone. The meaning is alerted by change in the tone just as much as it is changed by a consonant or vowel in English (Wang, 1978). More specifically, the pitch of the individual syllable determines the meanings of words. Tones vary in different dialects, officially spoken language - Mandarin has four tones: (1) level, (2) rising, (3) falling-rising and (4) falling.

In Wang's examples (1978), in English a rising pitch pattern is used for "John?" and a falling pitch pattern for "John!". It is obvious that, although different tones represent different attitudes, the meaning of the word remain the same. However, in Chinese, "má" with a rising pitch pattern signifies "hemp" and "mà" with a falling pitch pattern means "to scold". Thus it can be seen that a syllable can be pronounced in each of these four tones, each representing a word with a completely different meaning. Each syllable necessarily has a nucleus to bear the tone, usually a vowel. Therefore, the nucleus and the tone are two necessary components of the Chinese syllable. One of the most distinctive features of Chinese words in comparison to most European words, is the non-existence of clusters of consonants before and after the nuclear vowels. Western words with consonant clusters will be broken up and each consonant has its own syllable. For example, *Marx* is conventionally pronounced ma-ke-si (Wang, 1978). The first sound, *mǎ*, represents the written character for "horse", the second, *kè* signifying *overcome* and the third, *sī* denoting *thinking*. Each tone can also bear a number of homonyms. For instance, the sound of *yī* with the level pitch pattern can mean "one", "clothes", "doctor" and "to cure" while *yí* with the rising pitch pattern "aunt", "doubt", "suitable" and "to shift". Essentially a Chinese written word has neither direct nor explicit relation to the sounds.

The Chinese language is also characterised by its monosyllabicity. A syllable is represented by a single written character, for the most part, acting as a meaningful unit and thus relating closely to a morpheme or word rooted in English. Two or more written characters can form polysyllabic compound words conveying a whole meaning which is partly related to respective meanings of single words. As the language evolved, compound words flourished in usage. Nowadays, polysyllables made up of three, four or even five characters prevail. This kind of usage enriches the language with liveliness, accuracy and clarity but it has lost the elegance and conciseness of classical languages. As a matter of fact, however, the more people use classical expressions, the higher esteem they merit. Highly-educated people are particularly well equipped with this command of language.

The lack of inflection is another characteristic of the Chinese language. It is obvious that inflectional affixes virtually do not exist. Specifically speaking, verbs are not inflected for person, number, tense or nouns for numbers. In modern Chinese, a specific classifier must precede most nouns, for example, *yì chāng zhǐ* (literal syllables in Chinese) representing 'a sheet of paper', *yì běn shū* signifying 'a book' and *yì liàng chē* singling out 'a car'.

Chinese is represented by thousands of distinctive characters and therefore it is categorised as an ideographic or logographic language in terms of its writing system. In fact, a Chinese child learns about 2,000 characters by the time he is ten years old but he needs to know two or even three times as many characters to be able to read even a newspaper (Kenneth, 1986). The number of strokes required to draw a Chinese character can be as high as 35. A large proportion of Chinese characters consist of two elements, one is the signific and the other is the phonetic (Hung & Tzeng, 1981; Kenneth, 1986; Norman, 1988). The former, "the component of a graph" (Norman, 1988, p. 68) representing the class of objects to which the word belongs, conveys the meaning and the latter indicates the sound. For instance, All words relating to fire, such as "cook" and "burn" contains the "fire" signific. The phonetic consists of the character for a word whose meaning is entirely irrelevant to the word, but whose sound happens to be the same. Therefore the character for "clearness" consists of the "water" signific plus the phonetic "blue", the word for "blue" being sounded the same as the word for "clearness". The basic sentence in Chinese has the similar order of subject-verb-object as in English. Hence the sentence *womern heur sher* is word for word "We drink water". However,

there is a tendency in Chinese to leave out either the subject or the object (Wang, 1978). Thus *wǒmēn huer* (We drink) or *huer shēn* (drink water) are both common sentences. In response to the well-recognised fact that numerous-stroke characters make reading and writing a difficult and time-consuming task, attempts were made to simplify the writing system of the Chinese language in mainland China 30 years ago (Kenneth, 1986). In 1958, a new Chinese alphabetic system based on the Roman scripts was introduced in mainland China in pursuit of easy readability and handwriting of Chinese texts.

Apart from the officially spoken language based on the Peking dialect being brought from mainland China, the mainlanders obviously wanted to emulate western culture. With the aim of reuniting with mainland China, the Nationalist Government had, until recently, suppressed Taiwan dominated dialects and folk culture and it had set up special institutions to actively preserve Chinese culture. In fact, at the present time, cultural patterns in Taiwan have been trying to redevelop a Taiwanese identity and to incorporate the increasing influence of the western culture at the same time.

In the Chinese family, traditionally, males are heirs. Although influences of foreign culture increase over time, the father still holds the pervasive authority in the family of Taiwan. Recently, the authority of the father has been transformed from power to respect, particularly in the families in which the children are highly educated. In other words, children are no longer required to submit themselves fully to the parents. It is the male children who are obliged to care for the parents when they are old and worship them as ancestors after they die. Children are much desired unless a family is too poor to care for them. However, there is an increasing trend for highly-educated families to have only one or two children. It remains relatively true and widespread that male children are more favoured because they can carry on the family name.

Generally speaking, Chinese infants enjoy the caring, intimacy, and affection of parents and grandparents. This is because of the traditional values of the family. Before age six, the mandatory age of school, the children of the middle-class families receive education from family and qualified kindergarten. Special attention is given to patterns of social relationships, recognition of words and



numbers, and counting concrete objects. This leads to literacy and numeracy. They also learn to recite Chinese classical poems and practise writing their names.

Many low-class non-skilled parents move from poor villages and live in the outskirts of the city. They are mostly employed in low-paid jobs. These parents have to leave their children at home and work until late at night in order to earn enough money to live. So their children receive a different type of pre-school education from that of the middle-class group. As a result, this kind of child spends most of his time in an unrecognised kindergarten or aimlessly playing around inside or outside his home. He learns inappropriate behaviour and habits which become too ingrained to be changed by formal school education afterwards. It is obvious that, apart from the inevitable lack of proper care for health, ordinary life routine and intimacy, children such as these are not sufficiently and adequately socialised in terms of interpersonal relations, experiential knowledge, or basic skills.

In contrast, the children who remain in the country are brought up to be able to look after younger brothers and sisters, to feed animals, and to do simple household tasks, taking responsibility for the family. Children are required to be obedient to the older members of family, and to parents in particular. Threats, scolding and even physical punishment are used to get children disciplined in the rural farming family.

The fact that all school-age children attend school has changed the quality of Chinese childhood. Even in the rural areas, and particularly among urban parents, there is a consensus that children should remain at school as long as they can. It becomes clear that, along with more promising economic prosperity than ever, parents tend to expect their children to work as hard as they can in order to pass competitive entrance examinations for academic high schools and universities. Further education undoubtedly leads children to come in contact with new ideas, because of which children to a large extent look at traditional ceremonial life and conventional customs in a way different from their parents. Although in Taiwan basic filial respect is still given more weight than in the West, socialisation within the family has been gradually affected by western culture and movements related to human relations. Especially among those highly educated, individuality, self-reliance and the rising awareness of women's competence in relation to employment and society come to merit more recognition and emphasis.

Traditionally, for the Chinese, teachers are highly respected, although they have low salaries. In ancient China, the teacher was on the list of five categories held in the greatest respect. The imperial tutors could be seated in an equal position to the emperor, and were best rewarded. The teacher has been regarded as a model of virtue, knowledge, justice, and righteousness. Thus, the all-prevailing authority of the teacher has been generally well recognised in educational practice and interpersonal relationships, and is deeply rooted in the Chinese community.

Nowadays, the people of Taiwan still retain such conventional feelings for teachers as individuals of virtue, and have high respect for their authority. Parents surrender to the teacher's personal, instead of the professional, authority, when their children are young, in primary school. On the one hand, primary teaching is thought by the general public and those highly educated middle-class as a simple job. It is not thought of as of either high enough or as exclusively professional in terms of knowledge and skills needed, compared to their counterparts at higher levels of schooling. On the other hand, the parents are very concerned in case the teacher will put their extremely ignorant and vulnerable children at a disadvantage. Therefore, the parents tend to fully respect the teacher, and by making themselves personally known to them to ask teachers to take care of their children better. The middle- and upper-class parents normally contact the school administrators if they expect the teacher to do something for their children or if they are dissatisfied with what the teacher is doing. These parents are anonymous to the teachers when their expectations are passed by the principal or headteacher. Certainly, administrative personnel are less significant than the teacher as a result of their distant relationships with children.

As we have seen, Taiwan has won worldwide recognition for a remarkable success story and 'economic miracle'; in particular, education has undoubtedly been a potent force in achieving that prosperity and the achievement of well-developed modernisation. And the educational statistics below show that school education has paralleled economic prosperity over three decades.

## 1.2 Education in Taiwan

As described previously, despite political isolation from mainland China, Taiwan is essentially a Chinese-based community. It is reasonable to gain real and comprehensive understanding of Taiwan by looking back to the traditional and cultural background from which it evolved. Therefore, it is vital to introduce education in Taiwan with a general description of Chinese education in both ancient and modern times.

### 1.2.1 A general description of Chinese education

The Chinese have been more concerned with both history and learning than other people (Lumley, 1976). From ancient China to the modern society, education has been the means of creating elite groups of wisdom and vision, civil servants for administration with desirable virtues, and cultivated people of knowledge and morality.

#### *Classical education*

In China, education is deeply appreciated and respected. Since the earliest times, the most respected and honoured people have been the gentleman-scholars dedicated to seeking knowledge and well-being. Therefore, they were thought to be on a level higher than others (Ho, 1986).

Confucius (551-479 B.C.), the best-known philosopher and educator in Chinese history, laid the foundation of educational ideals and practices for the country. He argued that the gentleman-scholar should play an active role in society by serving the ordinary people. The preferable role suggested was that of the governmental official who was the model people could follow.

In his arguments, Confucius pointed out that a broad body of knowledge based on learning classics by rote was useless and irrelevant to the running of the administration, thought to be duties of a mandarin. Having seized the shortcomings of over-reliance on academic disciplines, the Master called forth the importance and significance of desirable virtues for mandarins: "The foremost is to be loyal to your superiors, keep all promises, refuse the friendship of those who are not like you" (Chen, 1966). Since then, education in China had become the key to

prestige, power, and influence. This point of view ran counter to that of the Taoist who insists that the gentleman-scholar should not participate in social life but devote himself to the pursuit of knowledge and well-being without social distractions.

Until the 19th century, education was generally restricted to the upper or ruling classes. Those who pursued private tuition aimed to pass the imperial civil-service examinations. There were exceptions to the rule, but these were very small in number (Ho, 1986). To pass those examinations, a scholar had to recite and interpret complete texts of classics within fixed rules set by well-known scholars in front of the imperial officials in both the written and spoken modes. A two-line poem best illustrates the advantages and disadvantages of studying for the civil-service examinations: "No one sends me his regards during the ten years in which I studied; but I become very well known to everyone the moment I pass the examination". Even scholars who failed the examinations generally held the view that studying the Confucian-based or other classics helped them improve themselves in many significant ways. The thinking behind this idea was that the scholars themselves tended to heed and practise the doctrines of virtue, moral principles and disciplined behaviour, the theme running through the Confucian-based classics in real life, even though memorisation of the classics had not helped them to succeed in the examinations.

The individual's well-being cultivated through studying the classics was all the reward he wanted for his dedication to study. Such a perception of cultivation of humanity was thought to be important in Chinese education over the centuries (Chen, 1966). In other words, it was an ideal that the scholar made words and deeds go well with thoughts and enlightenment gained through a classical education. Learning the Confucian-based classics not only meant that the scholar absorbed the moral concepts and rituals which could sustain ethical and social stability (Ho, 1986) but that he also became proficient in the Chinese language.

Despite the fact that China had made outstanding scientific contributions, these were ignored by the academic work of scholars (Chen, 1966). By and large, for the ordinary people, education in the early years took place in a private house which served as a village school. Here the children were taught by a tutor, who was

usually invited by a family to teach their children in return for accommodation, food, and an allowance (Ho, 1986).

Due to the immense bureaucratic system linked with public examinations, it was possible that a hard-working scholar could become a civil servant in an elevated position. However, this system resulted in the majority of literary and knowledgeable men having little or no feeling or understanding of the social and economic reality faced by ordinary people. There was the implication that central to ideals of Chinese classical education were conservatism, elitism, humanism, moralism and patriotism. And it is still the same today. Furthermore, the present system of the centralisation of educational administration can be traced back to ancient China.

#### *Education in the modern society with special reference to Taiwan*

Nowadays, Chinese education, with special reference to Taiwan, is popularised, equalised, liberalised, bureaucratised and modernised. Educational achievement makes personal success and self-fulfillment more versatile, promising and accessible than ever. Such an encouraging development results from economic prosperity, meritocratic bureaucracy and increasingly intrinsic motivation to the complete growth of an individual in the modern society. Education has become an invisible investment for parents, industry, and the government.

The public academic high schools and government-funded universities have become overcrowded in Taiwan because students can enjoy high prestige in these educational institutions. So competition to get into the good academic high schools and national universities is high. And vocational high schools and junior colleges have been set up to alleviate the overcrowding in academic high schools. For students in Taiwan, earlier education means the route to success in passing the later entrance examination.

Concerned parents and teachers of junior and academic high schools all try to prepare the children to do well in the examinations. To do this, a substantial number of parents pay for their children to have private tuition. They do this for children of even primary school age. There is a growing concern that competition for entry to academic high schools and universities distorts the development of education in the primary, junior and academic high schools. It is seen to have a

detrimental effect on the students in the sense that the highly valued access to higher education reduces the function of school education to academic learning serving as the sole key to high-profile success for the future.

### **1.2.2 Evolution of the school system**

The current school system in Taiwan is an evolutionary product. The modern school system commenced with the School Law proclaimed by the Machu Court in 1902 (Ministry of Education, 1989). The initial trial was modelled on the Japanese system. The historical events that followed introduced a seven-decade evolution of the school system, as a mirror of influences of foreign forces on China in general and Taiwan of today in particular.

As Chen reviewed (1981), the Japanese model was thought to be inappropriate for the newly-established Republic of China after the revolution of 1911 which overthrew the Ching Dynasty, the last empire of China. A new system was introduced in 1912. Before the Sino-Japanese War, which started in 1937, the Nationalist Government in mainland China was interested in the educational ideals and practices of European countries. So a number of European educationalists were invited to China to make suggestions for teaching methods, curriculum development, and educational administration. In recent years, closer relationships between Taiwan and the United States have revived American influences on education. The rise of American power, and the enthusiasm about democracy after World War I, paved the way for the transplanting of an American 6-3-3-4 school system in 1922, with six-year of primary education, and two-level secondary education - three years of junior high school leading to three years of senior high school. These then follow four years of study to degree level. The 6-3-3-4 system has remained as the mainstay of the educational ladder since the Nationalist government retreated to Taiwan in 1949.

### **1.2.3 Main features of the existing school system**

According to 'Education Statistics of the Republic of China' published by the Ministry of Education in 1989, the existing school system (Figure 1.1) contains the following main features. A student in Taiwan may spend more than 22 years in school, including two or three years in kindergarten, six years in the primary

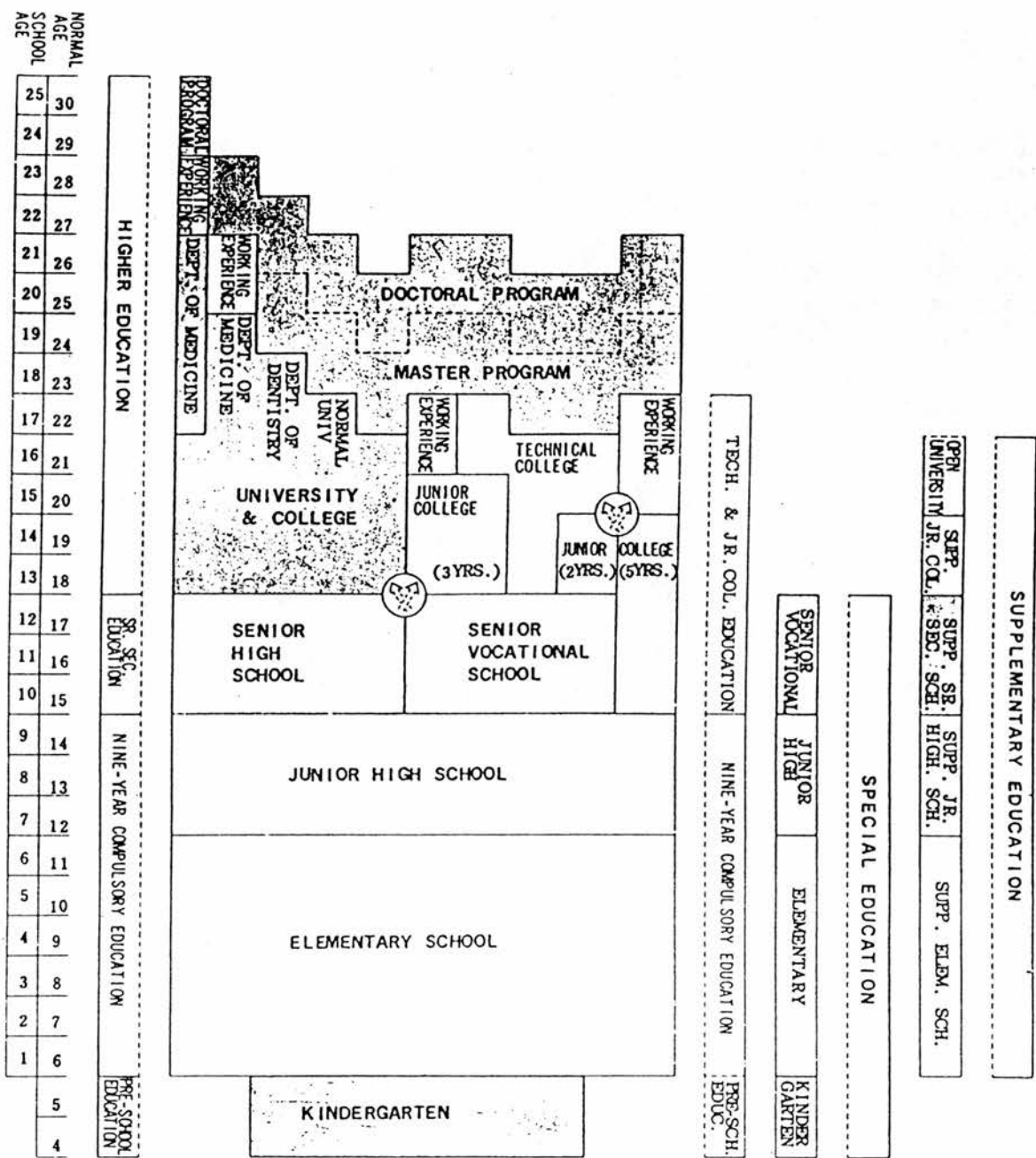


Figure 1.1 The current school system in Taiwan

school, three years in the junior high school, three years either in the senior academic high school or the vocational school, four years in a university or college as a general rule, a minimum of two years of master-degree-awarded graduate program and two or more years of additional studies leading to the doctoral program.

In attempting to provide students with a wide choice of vocational education at the secondary level, and to relieve the congestion in academic high schools, junior colleges of five years - for the most part privately run - were introduced in the early 1960's. In these colleges, the student is provided with a general education similar to that provided in the senior high schools in the first three years. Then in the last two years he is given vocational training.

It is documented that the main purpose of pre-school education is to provide appropriate care for children before six years of age and to help them develop good habits and adapt themselves to social life. Regulations state that teaching children to read and write syllables and Chinese characters in kindergarten is prohibited. In 1950-51 there were only 28 independent kindergartens with 17,111 young children. In 1988-89 there were 248,489 children in 2,548 kindergartens.

To popularise education and eliminate the negative effects of the competitive entrance examinations to academic high schools, the government extended free and compulsory education from six to nine years. This applied to children aged from 6 to 15. Since 1968, six years are spent at primary school and three years at junior high school. The Constitution decrees that every child at this mandatory school-age is required to go to the school in the district where he resides.

Compulsory education is defined as the period during which Taiwanese children receive fundamental education, the main emphases being on basic knowledge and skills, the physical and moral development of children and the inculcation of disciplined behaviour, ethical principles and patriotism. Textbooks and tuition are free but the children are expected to buy their own notebooks, pencils and stationery. Most primary schools are government-owned and operated by the city and county office of education. Private schools are either church- or private-industry-supported, but government-controlled. The written Constitution guarantees all citizens' right to receive equal education and certain proportions of the budgets at different levels of government must be spent on educational affairs.



Educational administration is operated at three levels: central, provincial and county. At the central level, the Ministry of Education is in charge of development, dissemination of regulations, implementation, and consultation over educational policies. The provincial government has a department of education. The municipal and county governments include bureaux or sections in charge of education. As well as implementing educational policies set up by the government and the Ministry of Education, these educational authorities are also responsible for social education, and the administration of libraries, museums and playing fields.

#### **1.2.4 Primary 1 education in practice**

Compared to other levels of the school system, the educational administration of primary schools is virtually centralised. The educational authorities, under government control, are in charge of the allocation of budgets to schools, the dissemination of relevant policies, the inspection of school management, and the development and distribution of organisational resources in use at school.

##### *Organisational features*

In respect of primary school education, the educational authorities regulate procedures and activity structures involved in administration relating to school development and management. Factors integrated into school administration exercise indirect influence on the work of teachers and children, in comparison to the immediate contexts which shape the work of teachers and children as they occur in reality.

In the primary school, staff can be classified into three categories in terms of work and responsibility. The Principals are fully responsible for running the school administration based on the governmental policies and regulated activity schemes; they do not teach. The second group is the administrative personnel recruited through public civil-servant examinations. They are equipped to deal with administration in the areas of health, finance and personnel.

The majority of the school personnel consists of the teaching staff and they fall into three categories in terms of responsibility and teaching specialisms. The first is the class teacher teaching all subjects and dealing with administration related only to pupils of her own class. Teachers in Primary 1 and 2 are a case in point. In average-

size primary schools, primary 1 and 2 classrooms are self-contained and the children of a class are taught by just one teacher. The second is the special-subject teacher who has special training in certain subject areas such as natural sciences, music, painting, and handcraft. The more central the school is, the larger it is, and the more special-subject teachers there are in school. The younger children can then take lessons on these special areas by special-subject teachers. On an average, special-subject teachers teach the children above primary 3 because knowledge and skills incorporated into the learning materials involve more specialisation and greater difficulty.

The third group is basically recruited as teaching staff but specially deal with the general administration of school. They are invited to help the Principal administer affairs concerned with school management, teaching routine and finances and plan school-wide policies and activity, and above all, support the work of teachers and children by supplying necessary organisational and human resources. Due to these extra commitments to school administration, these teachers mostly teach so-called minor subject areas, such as physical education, calligraphy, painting, writing, handcraft and extra-curricular activities, regardless of lack of special training in these subject areas.

There is a notable relationship between teachers' commitment to work and the school catchment areas in Taiwan. In order to understand better teachers' work in general and comments made by the sample of teachers in this study in particular, it is necessary briefly to illustrate this relationship which affects teachers' perspectives and actions upon their work. The parents in central areas, by and large, are well-educated professionals and have high incomes. Most of them have greater aspirations for their children's success in school. A significant fact is that they hardly admit that their children are incapable of making good progress. As a consequence, the teachers working in central areas are consistently under great pressure from parents' expectations and demands for their children achieving good results. In reality, the schools in central areas impose strict regulations on, and inspection of, teachers' work according to officially-issued timetables and progress schedules set for teaching textbook matter and instructing workbook tasks. In response to parents' attitudes and influences on school, teachers in these areas attempt to discipline classes rigidly, to set out activity structures clearly and progressively, and to require punctual completion of children's work.

In contrast, almost all parents in suburban areas are either illiterate or poorly educated non-skilled labourers, and some are single parents. They have sincere respect for school and the professional authority of teachers, as a result of social norms and feelings of ignorance and inferiority. Therefore, parents in these areas, by and large, fully accept the reality and consequence of the children's inadequate abilities, and their own limitations in preparing them adequately for learning in school. Because parents fully support schools and teachers in moral and psychological terms, schools in suburban areas do not set up the same specific and strict standards of teaching and children's achievement as the schools in central areas do. Teachers in the areas are freer to do their work in the way they want, within centralised regulations of all kinds, compared with their counterparts in central areas. To a notable extent, teachers also easily gain appreciation, gratitude and the support of parents for their instructional practices. It appears to be a fact that, without impending pressure from parents, and serious scrutiny at the school level, achievement levels are less deliberately striven for by the teachers in the suburban areas.

The curriculum implemented throughout formal schooling denotes subject areas listed on the syllabus in general and subject matter incorporated into the subject-specific textbooks in particular. The subject areas each school-age child in Primary 1 has to learn are Chinese language, mathematics, natural science, social science, music and dancing, painting and handcraft. The textbooks and workbooks are compiled by the National Institute for Compilation and Translation and published by the Department of Education of Taiwan provincial government in four subject areas: Chinese language, mathematics, natural science and social science. Under the regulations in force, no person is allowed to publish school books. All primary schools in Taiwan use this uniform set of textbooks and workbooks that are sold to all pupils.

The Department of Elementary Education under the Ministry of Education is responsible for drawing up regulations and recommending the development of textbooks and workbooks. However, few of the staff of the Department is well informed about or specialised in the field of primary education. The primary curriculum, embodied in a set of textbooks and workbooks of the four subject areas, is developed by a special committee composed mainly of well-known academics of the universities, and high-ranking government officials responsible for the area.

Views of non-practitioner committee members overshadow a tiny proportion of primary teacher representatives invited to take part in the development of the curriculum.

Although the books are organised by units of subject matter, there are three ways by which to formulate the content of the textbook and workbook of the same subject areas. The first is that the content of the textbook, by and large, is the same as that of the workbook. The subject of mathematics is a case in point. The second is that the content of the textbook is comprised of textual themes presented in the form of discourses. The workbook for the same subject area covers the same theme but is made up of questions and problems which the children have to answer and solve. The subject of language is another case in point. The third is that the content of the textbook is composed of pictures and illustrative objects accompanied by words which represent them, whereas that of the workbook of the same subject areas is programmed in the fashion of actual operations, like those involved in the subjects of natural science and social science.

The syllabus is outlined on a sheet of paper put on the outside wall of the classroom for the convenience of visitors and inspectors. Figure 1.2 shows an example of a Primary 1 syllabus showing periods of time and subject areas arranged for a class for a week. Across all primary 1 classes, there is a variety only in order of arrangements of subject areas. In terms of a 40-minute period, as the example syllabus indicates, for instance, each child is expected to undergo 7-hour lessons on Chinese language each week.

Time of day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7:30 – 8:00	Self-study					
8:00 – 8:20	Assembly					
8:20 – 8:40	Registration–Health–Ethics–Physical-examination					
8:40 – 8:50	Recess					
8:50 – 9:30	Chinese	Chinese	Maths.	Chinese	Chinese	Chinese
9:30 – 9:40	Recess					
9:40 – 10:20	Chinese	Chinese	Chinese	Chinese	Chinese	Nat.Sci.
10:20 – 10:30	Recess					
10:30 – 11:10	Maths.	Nat.Sci.	D. & H.	Maths.	Soc.Sci.	Nat.Sci.
11:10 – 11:20	Recess					
11:20 – 12:00	M. & P.	Soc.Sci.	P. & H.	M. & D.	M. & D.	M. & D.
12:00 – 12:45	Lunch time					
12:45 – 13:15		Nap time				
13:15 – 13:20		Recess				
13:20 – 14:00		Extra.				
14:00 – 14:10		Recess				
14:10 – 14:50		Extra.				

*Figure 1.2 An example syllabus*

<b>Key:</b>	Maths	mathematics
	Nat.Sci.	natural sciences
	Soc.Sci	social sciences
	M. & D.	music and dancing
	P. & H	painting & handcraft
	Extra.	extra-curricular activities

*Immediate contexts of learning in Primary 1*

For the convenience of the presentation, the immediate contexts of Primary 1 in Taiwan can be described in four categories: (1) physical context; (2) language context; (3) situational context; and (4) interpersonal context. In reality, all four contexts exercise overlapping influences on pupils' progress in learning and performance in reception classes.

As far as the physical context is concerned, the size of the Primary 1 classroom is generally similar to that of a British Primary 1. However, a Primary 1 class in the city contains, on an average, forty-five pupils. Most classrooms are equipped with (1) single desks, with chairs for two pupils at each one; (2) teachers' cupboards; and (3) blackboard and bulletin boards.

Crowded seating arrangements give rise to the prevailing fact that little movement is allowed in the classroom and pupils cannot walk about freely. In most primary 1 classes, the pupils are all seated in rows and are required to look straight forward at the teacher and blackboard and complete written work most of the time. Under these circumstances, children's learning is closely related to the quality of 'chalk and talk' teaching, the opportunity to see the teacher's demonstration clearly, and the size and brightness of the objects shown on the blackboard or by the teacher. In fact, the pupils seated on the farther left- and right-side rows frequently have a restricted view which prevent them from following the information properly and promptly.

Although teachers are required to arrange the classroom as a stimulating environment for children's learning, limited and crowded spaces, sitting in rows and shortage of finance restrict the quality of layout in the physical context of the classroom. There is no room for teachers to plan learning activity which requires space. Neither are there many interesting things on show to stimulate children's thinking and learning. On the whole, the classroom has the same layout for a whole semester instead of being changed about to suit the different learning programme. It is clear that being seated in rows deprives children of the group dynamics in the classroom which is well recognised as an active force of learning. Drill practice, recitations and doing written work are the most common activities seen in class.

Language context plays a pivotal role in children's learning in Primary 1. A vast amount of information is conveyed by the spoken language - Mandarin, and the written language - Chinese characters beside correspondent syllables. As prescribed, three-quarters of the time is assigned to Chinese-language teaching and learning. An entrant is expected first to master the reading and writing of phonetic symbols integrated into syllables (the system known as "Pinyin" which represents Mandarin by spellings).

Each entrant is required to accurately read and write about 250 syllables in Pinyin in the initial ten weeks. Subsequently, children begin to learn to read and write Chinese characters and mark the corresponding syllables beside them. All textbooks and workbooks are written in Chinese characters beside syllables, and instructions are given in Mandarin. There appears to be an unwritten regulation that the home dialects are banned and children speaking dialects in the classrooms are warned or even punished.

After starting school, the pupil encounters a new situation that involves many aspects different from home. There are two situational variables specially seen in Primary 1, i.e. the timetable and the evaluation system. In accordance with the timetable which locates subject areas in certain periods, children's learning experiences turn out to be time-divided and subject-specific outcomes. To be able to acquire knowledge and skills through the lesson as scheduled, on the one hand, a 40-minute period is certainly not enough. On the other hand, the short span of attention of a six-year-old child simply fails to cope with the demand for processing a great deal of information in a 40-minute period. In catching up with the timetable, the teacher requires the children to sit still and follow the lesson carefully and promptly. Under these circumstances, it is very unlikely that children can stop to think and question what has been taught.

In Taiwan, examinations are potent factors affecting what students learn at school. Paper examinations are the most common type adopted to assess learning outcomes. Primary schools, even Primary 1, are not exempt from this system. In general, the subject areas examined are Chinese language, mathematics, natural science, social science, health and ethics. School-wide examinations of these subject areas take place three times a semester. In recent years, the educational authorities have left it up to the school to decide if entrants should join school-wide subject-divided paper examinations in the first semester of school. This is mainly because entrants are so unfamiliar with the school environment as a whole and are only beginning to get used to the varied kinds of routine of school. It is very unfair for young children who have not come to terms with the demands of school to be abruptly assessed under great psychological stress. However, most Primary 1 teachers still carry out this kind of paper examination in the four subject areas in informal ways in order to provide themselves and parents with concrete evidence of children's learning outcomes and progress which have to be recorded in school

reports. In addition, the teachers tend to give simple tests frequently so as to get feedback about what children have learned and to keep the children working hard. In reality, memorising subject-matter and informative facts and automatising the related skills are what is required to pass the examinations.

The interpersonal context is another facet related to the way pupil learn in Primary 1. Since starting school, the children interact with only one adult - the teacher - in a class. Primary 1 children's overwhelming dependence on the teacher, and the teacher's authoritative dominance, bring about a distinctive relationship comparable to that between the subordinate and superordinate in a bureaucratic organisation. The teacher usually disciplines the class and individual children by strengthening this kind of special relationship whereby the children are in a hidden way required to regard the teacher's words and acts as dogmas and standards they have to follow. It is well recognised that this kind of interpersonal context stops children from being active, creative and inquisitive, eager to explore the world around them at school. Since lesson activity proceeds through the teacher's lecturing to the whole class instead of individual exploration or group cooperation, children hardly interact with each other at all during class sessions. It is therefore hard to see patterns of relationships among children.

Children in suburban and rural areas appear particularly aggressive in the sense that they are inclined to touch or even hit neighbouring classmates for fun or in a desire to release uncontrollable impulses and energy. Having been kept sitting still in the classroom for a long time, children mostly run around, chase each other, play ball or games of making-believe fights in the playground during their ten-minute break. The suburban- and rural-area children, comparatively speaking, engage in these activities in a more provocative manner, such as real fighting and bullying each other. Interpersonal relationships among the children are rooted in kindergarten and neighbourhood friendships and strengthened by the proximity of seats in the classroom. Those who are very close to each other are very likely to chat in the class during the lesson sessions. This obviously prevents them from learning as they should.



### 1.3 Summary

In this first chapter, the structure of the thesis has been outlined and the general background and the educational system in Taiwan has been introduced. It seems that, on the one hand, the educational system is similar to that of most developed countries. On the other hand, the brief descriptions of Primary 1 education in practice reveal discouraging aspects which require special attention and great efforts on the part of the educational authorities, practitioners and academic workers. It is thus essential for the researcher to gain empathetic understanding through effective and sensible approaches to exploring and examining significant features of Primary 1 educational practice in a context in which children have to learn a great deal and have to work very hard in a tightly scheduled way from the moment they start school.

Without previous academic contributions to a description of the area from Taiwan researchers, it is inevitable that the review of research has to describe mainly the arguments, findings and implications of the theoretical formulations and empirical studies made in the West. The next chapter therefore reviews the literature about children's learning and performing when they start school at the conceptual and methodological levels, even though most of the findings relate to different educational contexts. Nevertheless, this review will prove valuable in relating the findings from the present study to possible future developments in Taiwan.

## CHAPTER 2

### Review of Literature

#### 2.1 Introduction

For young children, school is a very different setting from home in many significant aspects, such as physical conditions, human relations generally, and in the content and forms of stimulation through which children acquire knowledge and skills. It appears to be an inevitable and natural consequence of this that, as they enter school, children have to cope with demands which are unfamiliar to them.

Yet, before this study was undertaken, neither conceptual analysis nor empirical research had been done in relation to children's entry to school in Taiwan, nor into the idea of 'school readiness'. There is no such thing as 'readiness' in general terms within the framework of Chinese people's thinking. This is well reflected by the fact that there are neither literally nor conceptually definable words representing 'readiness'. Practically speaking, cultural beliefs and social expectations assume that children are taught to be able to learn things to the utmost at school; and difficulties adapting to school; and backwardness generally, are thought to be children's own problems and faults. More significantly, those responsible for the educational system in Taiwan pay special attention to the quantifiable aspects of school education which are used to indicate the child's progress. Together these two factors have prevented any serious concern about issues relating to children's starting school, both in pedagogical and administrative terms.

This area has also been ignored by researchers in Taiwan. That is not only because of the enormous demands of energy, commitment, and special skills, required to carry out field studies with young children and the well-recognised difficulties in studying children within school contexts, but also because long-term academic research is not encouraged in Taiwan. Moreover, schools and practising teachers tend to reject the researcher. Apart from the reasons described previously, teachers are frightened to reveal their own ignorance and inabilities; they are nervous when being observed and interviewed, so that they often refuse to join research projects.

Although there are inevitable limitations in arguments and studies made by western academic workers to the current situation in Taiwan and to the main concern of this research, suggestions drawn from western literature do remain relevant, at least to a certain extent. It is central to this research to identify the factors affecting beginners' progress in school in the immediate context in which significant and crucial demands are being made. This chapter therefore sets the scene for the exploration of relevant aspects to be considered in the field studies of the research looking in particular at the framework of interactions between the individuals, situations, and outcomes.

As research in the West had its origins in philosophical views about the relationship between education, society, and the child's individual development, that must be our starting point. From there, the importance of the concept of 'readiness' is explained and developed through an examination of both the psychological and the educational research literature. The concept of readiness can be made more precise and relevant by contrasting the experience of starting school with children's previous experiences of pre-school and home. In addition, studies on infant education are also reviewed in order to gain insights into the organisation and system practised in different cultures.

The major distinctive differences in school education between the West and Taiwan Primary 1 classrooms lie in its organisational structure and in the emphasis given to the various kinds of learning activities and materials provided for the child. With special reference to Taiwan, reception classes are the departure points from which children start to receive knowledge and skills formulated in formal, fixed and structural ways set in uniform schedules by national administrators and executed by the teacher for the class as a whole.

More specifically, some academic subject areas are given more weighting than others in terms of time allocations given to the syllabus and in the amounts of subject matter children have to cover. Learning and performing tasks in the academic subjects, in particular, are given the greatest emphasis. It will be necessary in this review of the literature to examine research findings on learning, thinking, and performing academic tasks introduced in classroom contexts, in which children face up to the demands involved in learning materials. Moreover, Primary 1 is specifically characterised by being the starting point of children

learning to read and acquiring knowledge of mathematical concepts and operations in formal ways. It is thus necessary to review arguments and findings on acquisition and difficulties in relation to children's literacy and numeracy. Literature suggestions made for teaching in these subjects are also discussed.

## **2.2. Education and child development - the concept and practice of readiness**

The most important issue in early childhood education is the relevance of educational aims to the nature of child development on which choices of the process and material are primarily based. Here, only a brief summary is appropriate as a background against which to view both the psychological literature and the educational practices in the West and in Taiwan.

### **2.2.1 Educational ideals**

Three mainstreams of western educational ideals considered to influence educational practices are: romanticism, cultural transmission, and progressivism (Kohlberg & Mayer, 1972; Kohlberg et al., 1987). Romantic thought begins with notions and practices advocated by Rousseau, who, in *Émile*, stresses the importance and significance of the natural development of a child, and severely criticises the adverse effects of unnatural society on the innocent child. Having suggested that the child should be protected from the influence of society so that he can grow up in the way Nature intends him to do, Rousseau suggests the need of reforming society for the benefit of early childhood education (Schmidt, 1973).

The underlying assumption behind Rousseau's revolutionary position was that there is a natural development which inevitably takes place and on which an examination of the "artificial" influences of society can be built (Schmidt, 1973). More recent romantics, such as A.S. Neill, pursue the spirit and practice based on the faith in the child's "inner goodness" (Kohlberg & Mayer, 1972). An intentionally planned environment is thought to suppress the child's intrinsically spontaneous inner attributes. The teacher's task is, thus, not to teach the child, but rather to bring him to do what natural development prepares him so to do.

The romantic ideal leads to an awareness and recognition of the existence of the inner self and of the values of childhood. More specifically, it indicates that children should be allowed to develop aspects of physical, intellectual, emotional and social development at their own rate, in ways which can facilitate each other. However, there appears to be an exaggerated reaction, in that the romantics seem to deny any positive effects of cultural transmission on child development.

According to Kohlberg and Mayer's review (1972), the second stream of ideals of education can be traced back to traditional education in the classics, which attempted to transmit the tradition to the next generation, knowledge, skills and rules valued in the past, which were to be internalised to ensure the continuation of that culture. In the present day, educational technology and techniques of behavioural modification are identified as representing this ideal, by assuming that the child responds to demands of culturally given stimuli and internalises them through means of the imitation of the modelled behaviour, the provision of intentional teaching programmes and of carefully designed reward systems.

Traditionally, liberal education in the form of classics with special attention to humanism, aimed to cultivate culturally educated Western man. Modern technological education leads to vocational training adaptive to technological society. However, in respect of childhood education, both traditionalists and behaviourists point to the primacy of the development of literacy and numeracy, which constitutes the main theme of early formal schooling nowadays (Kohlberg & Mayer, 1972; Schmidt, 1973). Obviously, this culture-transmission ideal of education emphasises the predetermined bodies of knowledge and skills evaluated by standards of culture. By this ideal, the child is assumed to be a passive recipient expected to reproduce the cultural ideal. However, it is clearly indefensible totally to ignore what is known about children's natural development, individual strengths, and desire to learn.

Since Dewey (1938) formulated the philosophy of pragmatism as an educational ideology, progressivism has become a very profound and prevailing ideal throughout the middle of this century. For the progressive, education empowers the child's natural strengths which are used to accommodate problematic aspects of environment and society. Development is seen as a progression along ever-refined

interactions between the child's innate qualities and challenging situations provided in accordance with sequential stages of development. In Dewey's words,

Education is the work of supplying the conditions which will enable the psychical functions, as they successively arise, to mature and pass into higher functions in the freest and fullest manner. (p.207)

Within this educational ideal, the child's experiences function as driving forces which initiate his thinking in response to intellectual challenges. Educational situations act as problem-based stimulations through which the child's cognitive and psychological development can be fostered towards higher levels. Thus, progressive education appreciates the innate capacity of the individual, the role of stimulating environment, and above all, the power of dynamic interactions between the individual and his environment. Unlike the romantic and culture-centered idealists, who either idealise or ignore the developing characteristics of the child, the progressives regard the child as an active thinker and problem-solver. But the recognition of the strengths and limitations of the educational environment in affecting the child's development leads those concerned to view the potential of education with great caution.

It is from this ideal that we shall proceed. It implies that the provision of education should be based on a careful analysis of child development, i.e. maturation, learning, and experience. And this, in turn, justifies the prominence given to the concept of readiness within educational psychology.

### **2.2.2 Readiness, maturation, development, learning and experiences**

#### *The concept of readiness in psychological terms*

Rousseau's revolutionary ideas led to observations of children in an attempt to identify aspects of 'natural' development on which better and fuller recognition of their needs might be based (Schmidt, 1973). The premise behind Rousseau's diagnosis of the adverse effects of society implied that psychological attributes could be traced from any point back to their origins in 'natural' development (Kagan, 1984). In the post-Darwin era, this romantic faith was transformed to a scientific axiom in terms of the biological influences involved in development of the child (Schmidt, 1973).

The effects of learning began to be explored seriously after three laws of human learning were inferred by Thorndike from experiments on animals (Thorndike, 1913). One of these laws involved the necessity of "readiness" which Hilgard (1958) interpreted as an "action tendency", which was aroused as a result of preparatory adjustments, attitudes, and so on. Fulfilment of this tendency led to satisfaction, while non-fulfilment brought about dissatisfaction and disturbance. In this sense, readiness thus denotes a preparatory state of being set for action. Having been conceptualised at more elaborate levels as a result of an increase in intellectual resources, readiness is now seen as the cumulative repertoire of an individual's maturation, development, growth, characteristics, and experiences, which enable the individual to profit from the world around him.

Maturation is thought to be a different factor from readiness, but is one of the major influential conditions (the other being learning) that profit an individual in developing readiness (Ausubel et al., 1980). In Bee's terms (1985), maturation refers to "internally determined patterns of change in such things as body size, shape and skills" that unfold according to "instruction" which are "presumably part of the genetic code.... Maturationally determined development, in its pure form, occurs regardless of practice or training" (p. 9). Similarly, Ausubel et al.(1980) defined maturation as "those increments in capacities that take place in the demonstrable absence of specific practical experience, and that are attributable to genetic influences". (p. 57) Ausubel et al. argued that development was "inclusive of both dimensions of behavioural change of substrate and overt aspects, as well as of maturation and learning", while readiness was "the current developmental status of an organism in such a reasonably economical increment in capacities", and growth represented the "relatively permanent changes in the neuroanatomical and neurophysiological substrate of behaviour." (p. 57)

It becomes clear that maturation, development, growth, and readiness conceptually and practically overlap with each other in certain aspects, and that the first three play a pivotal role in the development of readiness. Three main streams of psychological theories respectively conceptualise readiness from perspectives of relationships between maturation, development, and learning (Kohlberg & Mayer, 1972).

The maturationists, such as Gesell (1954) and Neill (1960), who view development toward maturation as a result of biological functions for the most part, assume that readiness is, basically, a consequence of biological growth. For the maturationists, adequate physical development, set in the chronological stages is the primary prerequisite for the child's success in engaging in any given task or activity. In other words, without certain developments in biological attributes, the child's failure to respond to the information and tasks given to him is inevitable.

The behaviourists and social learning theorists, such as Hull (1943), Guthrie (1952), Skinner (1953), and Bereiter & Englemann (1966), recognise development towards maturation as principally environmental, and so assume that readiness is a consequential product which enables the individual to respond to external stimulus-reinforcement contingencies satisfying the needs of an individual. However, behaviourists acknowledge limitations of environmental forces and reinforcement; individuals cannot act upon the physical-demanded task unless they have reached the requisite stage of biological development.

The third stream is developed by the cognitive-developmentalists, such as Bruner (1960), Kohlberg (1969) and Piaget (1970). Readiness is assumed by them to be an interactive product of both innate development and environmental variables. Viewed from this perspective, development towards maturation is undertaken through differentiation, assimilation, and integration of inner cognitive structures in order to solve problems and adapt to different situations.

#### *The concept of readiness in terms of educational psychology*

Generally speaking, from the perspective of educational psychology, readiness is considered to be based on the learner's cognitive functioning and learning progress. Early on, readiness was referred to as the adequacy of existing cognitive processing equipment, or capacities, for coping with the demands of a specific cognitive learning task (Ausubel, 1959). Readiness was also regarded as entry behaviour in terms of involvement in sessions of learning lessons (De Cecco, 1968). Having been put in a more specific context, readiness now represents the acquisition of certain subskills along with the developmental maturity to integrate these subskills into a required skill (Jensen, 1973).



Having made the criticism that most of the above writers have taken a less global position on the concept of readiness, Ausubel et al. (1980) argue that readiness is a cumulative developmental product reflecting the influence of all prior genetic effects, all prior incidental experiences, and all prior learning on cognitive capacities. From a similar standpoint, Reily and Lewis (1983) define readiness as the sum total of a child's maturation, development and factors relevant to the new learning tasks. Gordon's review of readiness (1982) takes a more context-bound view than those already presented. He conceives of readiness as the individual's state of preparedness necessary to produce the performance expected of him.

The concept of readiness has important implications for approaches to the child through means of educational programmes. There are two approaches categorised by Clarizio (1977): the natural and the accelerated. The natural approach, also called the "wait and see" approach, emphasises that the child should be allowed to become ready for school at his own pace. Hymes (1958), one of the advocates of this approach, claims that all the findings show that readiness develops as a biologically sound child grows and matures. The other approach - "the accelerated approach", also called the "letting development appear approach" - stresses that readiness can be facilitated or advanced by providing adaptable or suitable training and opportunities, especially during the early years. Drawing on this approach, readiness is thought to be developed or fostered, so enabling the child to carry out more important activities later on. This is what "An earlier yield will eventually produce a better yield" means (Clari zio, 1977, p.44). And, Bruner's view on readiness (1960) is similar in his claim that "any subject can be taught effectively in some intellectually honest form to any child at any stage of development." (p. 33)

For the time being these competing interpretations of 'readiness' in general can simply be noted. Our concern is more specific - readiness for starting school.

### 2.2.3 The concept and practice of school readiness

#### *The concept of school readiness*

For young children, first-grade schooling is an extremely new and challenging encounter, which influences many significant areas of their lives at that time and in the future. Therefore, those involved in early childhood education are particularly

concerned about the effects of the initial experiences on children's schooling - a concern which was anticipated by Plato.

And the first step, as you know, is always what matters most, particularly when we are dealing with those who are young and tender. This is the time when they are easily moulded and when any impression we choose to make leaves a permanent mark. (Lee, 1974, p.131)

The specific notion of school readiness was not explored until Gesell and his associates started to apply the theories of child development to develop school readiness test batteries (Ilg & Ames, 1972; Robinson, 1985; Gesell Institute, 1987). Over the years, the concept of school readiness has become more important as large numbers of children have been found to do badly in school right from the outset.

School readiness, as defined by the Gesell Institute, is the capacity to learn and to succeed in coping with the school environment (Gesell Institute, 1987). By school success, the Institute means that the pupil has the ability to learn, and sufficient energy to engage in, all aspects important for growing individuals. Gesell's view of school readiness basically draws on the premise that child development and human learning are both subject to the individual's maturity. Based on a full recognition of the effects of maturity on readiness, the child's developmental age, in accordance with his profile displayed in readiness tests, is defined and suggested by the Institute as a substitute for the chronologically mandatory age of school entry. In contrast, Robinson (1985) describes school readiness in terms of the maturational or behavioural development adequate to the requirements of school entry and subsequent promotion, and the teacher's demands and expectations. This definition highlights the fact that school and teachers play a pivotal part in children's readiness, in terms of the learning context *they provide* in school.

In short, school readiness reflects the position of the individual being fitted to the given requirements or tasks, rather than that of requirements or tasks being tailored to the individual. It is implied that, to increase the success rate of young children in primary school, those involved in early childhood education, especially educational personnel, teachers, and parents, should make efforts to develop children's readiness before starting school by strengthening the children's qualities in the direction of school requirements and the teacher's demands and expectations.

### *Identification of school readiness*

Starting school, usually between five and eight years of age (six in the case of Taiwan) is a crucial landmark in a child's life, for it marks the transition from home and pre-school to school (Renwick, 1984) - a period of coping with new encounters normally associated with puzzlement, excitement, stress, uncertainties, hopes, and fears (Salzberger-Wittenberg et al., 1983). For parents, it is an equally challenging period during which they have special responsibility for their children's adjustment to school.

Based on both the pedagogical implications of the concept of individual differences and research on child development, both the concept and assessments of school readiness have been extensively accepted and adopted in practice, particularly in the United States. In this sense, however, school readiness seems to have become a static and fixed concept rather than a relative one, as we shall see shortly.

Teachers and parents are more practically concerned with the issue of children's readiness than others. Undoubtedly, educational practices cannot profit from theoretical models of education if practising individuals do not take theoretical assumptions into account. The practical knowledge and experience of reception-class teachers is at the heart of the exploration of school readiness in reality, for most of the research of the area. It is in part because of that recognition that exploring teachers' characteristics is a crucial approach to understanding educational practices and to strengthening the effectiveness of educational research. Children's readiness can be seen as being determined by the teacher for the most part. Above all, it is necessary to explore the interpretive framework of the teachers in the sense that knowledge of the perspectives of teachers is important in understanding their expectations and actions (Nash, 1973; Sharp & Green, 1975; King, 1978; Elbaz, 1983; Pope & Keen, 1981; Shavelson & Stern, 1981; Oberg, 1987).

Findings of the study conducted by Gredler (1973) indicated that school readiness was a relative concept; in effect, what were regarded as the desired traits for success in the school varied from teacher to teacher. For some, the well-adapted child was docile, receptive, obedient, quiet and good at cognitive tasks, while for others that child was alert, questioning, inquisitive, independent, and good at practical work. It was also shown, in *Studies in Pre-school Education* conducted by the University of Strathclyde, that school readiness was a function of teachers' presumptions about

their professional tasks and activities within a certain school, and those in turn were affected over time by the behaviour and performance exhibited by the majority of entrants at the beginning of the school year (Clark & Cheyne, 1979).

However, the teacher's perspective is not the only approach to the identification of school readiness. A wide range of readiness tests have been developed and administered in diverse ways since the Gesell Institute designed the "School Readiness Test" (Robinson, 1985). Of them, the Gesell's readiness test and the "Metropolitan Readiness Test" are probably the most widely employed in the United States, although they have been criticised for their narrow coverage of achievement and their lack of credible validity, reliability and representative norms (Robinson, 1985; Meisles, 1987a, 1987b). It is suggested that, whatever sensible and reasonable measures based on the concept of school readiness are taken in practice, the teacher should "identify how best to assess the relationship between the child's current developmental level and the directions the teacher would like the student to take" (Gordon, 1982, p.1533). It is also suggested that classifying children under any label be avoided and children encouraged in both home and school are much more likely to be ready than those encouraged either in only one or in none of these environments (Gordon, 1982).

#### *Factors underlying school readiness*

Over the years, researchers have attempted to identify the factors affecting school readiness so that efforts can be made to maximise the opportunities for children's success in school. As early as 1955, McCarthy investigated pre-entrance variables required for school success and found measured intelligence (IQ) as the most outstanding factor of all. Apart from IQ, traits such as social maturity, emotional stability, self-reliance, and sound physical development were found to be significant aspects as well. It was also reported that relationships with parents were a crucial factor affecting children's readiness and that there was a relationship between a secure home environment and school success.

Later, Kohlberg (1968) identified age, and the general background of experiences and stimulations, as important factors, besides IQ, in influencing readiness. As we have seen, Ausubel et al. (1980) argue that all the prior hereditary states, prior encounters, and prior learning, in cognitive capacities influence readiness. But they

also indicate that the appropriateness and effectiveness of previous methods and materials of instruction are among the most important determinants of readiness.

Cronbach (1977) argues that the on-the-spot physical and mental states of children affect school readiness in a special situation at a particular moment. By physical attributes, Cronbach means health, with special attention to fatigue and energy, which influence school readiness to an evident extent. As far as the mental position is concerned, arousal and mental state are considered defined as the more relevant conditions affecting school readiness. Arousal signifies attentiveness; mental state denotes the ideas and interests occupying the child's mind at a given time. By situation, Cronbach means the people, things and encounters around the child, in the context of school, paying special attention to the teacher, the task set for the child, and the physical and social environment. Above all, physical maturity is regarded as the basis of readiness.

In a study on school readiness conducted in New Zealand, Renwick (1984) held that perspectives of teachers, and parents whose children were about to enter the first-grade schooling, provided a way of exploring the factors underlying school readiness. Six factors were found to cover the significance and importance of school readiness: (1) social maturity, (2) behaviour and discipline, (3) language development, (4) physical maturity, (5) desire to learn, and (6) specific skills. Social maturity primarily involved confidence and independence. Language development included speaking with confidence, possessing wide vocabulary, asking questions, and participating in discussions. Behaviour and discipline were referred to as obedience to the authority of the teacher and school staff and conformity to the organisation and requirements of the school and classroom. In addition, one aspect of behaviour was "sitting still and listening". Physical maturity was specified in biological physical skills, such as manual dexterity, muscular control, motor co-ordination, and the ability to adjust to the full school day without a need for an afternoon rest, and also the ability to manage clothing and hygiene. Both desire and general enthusiasm for learning were perceived as necessary and important factors of school readiness. The ability to pay attention was also given a high profile. Finally, the specific skills children were expected to acquire were of two forms. The first was the skills involved in using equipment, e.g. a pencil, crayon or scissors. The second was skills such as writing names, being able to count, recognising letters and colours, and knowing their telephone numbers and addresses (Renwick, 1984).

Compared with the theoretical assumptions discussed above, these conclusions seem to offer a more specific and practical frame of reference for school readiness.

Blair et al. (1975) grant that maturation, experience, relevance of materials, and methods of instruction, emotional attitudes and personal adjustment of the child, all determine the degree of children's readiness. For them, maturation is a factor in producing behaviour change genetically and in early life. It very likely has direct influence on brain weight and brings about a diversity of indirect effects on mental and physical growth. With regard to experience, the "home" and the "community" are of importance in children's readiness for school. Blair et al. stress that the most profitable and crucial experiences related to success in school are the development of spoken and written language. Moreover, children are more ready to tackle tasks and materials that meet their needs, and fit their capacities and interests. The final factor is referred to as "emotional attitudes and personal adjustment", which include emotional stress or uncertainties which bring with them a lack of readiness. Emotional disturbance is both cause and effect in children's maladjustment to school. Blair et al. identify general conditions which lead to emotional problems hindering children's readiness for school as follows: unmet needs, over-protection, rejection in the home, previous experience of school failure, and other home difficulties and disadvantages.

#### *Influences on school readiness*

Since school readiness is in part a function of chronological development, those involved in early childhood education have made considerable efforts to investigate the effects of the age of school entry on readiness for school. Starting age varies from country to country, some earlier than six years and some later than seven. Despite efforts at identifying an optimal age for starting school, nevertheless, researchers still cannot identify the age at when young children in general are ready for schooling. Not only is it implied that there are a number of variables involved in school readiness besides chronological age, but also that it is simply impossible to set a fixed optimal age of entry linked to chronological age. It seems that, whatever the mandatory age of entry to school, there is always a certain proportion of first-graders who are quite ready and some who are less ready.

Investigations and experiments with early admission or with younger entrants have brought out a wide range of results and conflicting implications. Some findings

showed that there was no significant difference in achievement of under-age children and regular-age children (Braga, 1969, 1971; McLeod et al., 1972) while Ahr's study found that, if screened carefully, half of younger intakes displayed excellence in intellectual performance and most of the others were average or advanced compared with their older peers (Ahr, 1967).

Being opposed to a focus on achievement, Weinstein (1969) attempted to explore relationships between school entrance age and adjustment. It was concluded that adjustment problems of the younger intakes principally arise from their difficulties in meeting the expectations of teachers and peer group. More recently, Hedges (1978) reviewed almost all the research on early entry and concluded that

- (i) children entering kindergarten under five years of age, or entering first grade under six years of age, tend to have more scholastic, social and emotional problems than children entering at an older age.
- (ii) no matter what the entrance age limit may be, the children who enter at the earliest possible age have more problems and achieve less than those of equal IQ who enter at the top of the legal entrance age range. (pp.7-8)

Similarly, Shepard and Smith (1986) argue that the youngest are nearly always less successful, and in a disadvantageous position, whatever the starting age in whatever system. However, the most encouraging argument is that "achievement differences between the oldest and the youngest first graders are small (and) the small disadvantage of youngness eventually disappears, usually by about third grade." (pp.79-82)

There is, however, other research that suggests that performance by the end of primary school depends on the length of time a child has attended, so the outcome probably depends on when the criterion is measured. A wealth of research on the effects of the age of school entry on readiness has brought out disputed arguments and suggestions during the past years. However, it seems to be a reasonable approach to this issue to suggest that the starting age is recognised as a relative reference rather than an absolute point.

In exploring the effects of prior experience, Thompson (1975) did not find better social or emotional adjustment in the children with nursery school experience but these children showed up better in their cognitive work in infant schools. Having

employed the *Adjustment to School Scale* developed by Thompson (1975) Hughes et al. (1979) found the inability to concentrate as the single most common difficulty encountered by infant school children. It was also shown that children had problems in the use and comprehension of language. Social relationships seemed to be a less common source of children's difficulties.

The above presentation and discussion demonstrate that three streams of educational and psychological formulations underlie the concept of school readiness. Despite differences in epistemologies and methodologies, the spirit and concern given to the significance of the relevance of the child's previous experiences to situational demands remains important. To help children learn and perform optimally, educational practices should take account of the scope and extent to which children's experiences at home and school support the children's transition and the acquisition of newly encountered knowledge and skills. However, the most recent research shows clearly the inappropriateness of taking school readiness to be only a resulting outcome, instead of a developing and adaptive process whereby it occurs. To gain a more realistic understanding and to indicate practical implications, the following section examines research on the differences between home and school which underlie children's difficulties in starting school, followed by a description of comprehensive and up-to-date studies on children's transition from pre-school.

### **2.3 Pre-school, home and school**

It is widely acknowledged that children's schooling is related to the relevance and adequacy of experiences obtained in social and educative settings before starting school. Starting school is a departure point from which school experiences affect profoundly many crucial aspects of children's lives. Generally, the school functions as a domestic organisation which does not have to compete with other organisations for pupils and its existence is unchallengeable (Carlson, 1964). Pupils do not have the right to reject compulsory education in school. Under such circumstances, the certain goal of school can hardly be fully realised as set because of unselected pupils who vary considerably in many aspects. A class of, say, 40 pupils may be necessary for economic reasons and to ensure efficient school management, but it also creates great difficulty in meeting the individual difference



between children encountered by teachers in this situation. This is the high price paid for this kind of school management.

### **2.3.1 Differences in home and school**

Most parents expect their children to acquire certain knowledge, skills and values and this directs their efforts in helping their children. Thus, the home environment is generally playing a role of a learning context in which children's intellectual resources and language facilities are promoted. There were several indications of the influences of the home environment on children found in the study by Tizard and Hughes (1984). It was indicated that the home environment provided a wide range of activities which enabled the children to learn about real life outside the home and the social world in which they lived. As specifically noted, intimate and intensive interactive communication between a mother and a few children promoted children's understanding at the intellectual level in which their interest was involved. It was also found that there were important differences in the environment of home and school, in terms of learning experiences, discipline, requirements for communication, and physical and social contexts.

Howe (1984) identified two major differences between school and home which children have to cope with: (1) the kinds of things learned and styles of learning emphasised; and (2) the circumstances in which learning takes place. For Howe, school education predominantly involves the acquisition of knowledge and intellectual skills, rather than physical-movement-oriented abilities; abstract and symbolic forms, rather than concrete representations; and the acquisition necessary for long-term achievement, rather than the immediate practical interest of children. Understandably, pupils in reception classes are not used to being engaged in activities with the deliberate intention, or their own purposes of, learning and remembering. Neither are those pupils used to learning on their own without substantial help, under circumstances in which only one adult is shared with many other children.

### **2.3.2 Children's experiences in the pre-school, at home and in school**

With regard to early schooling, attention has been paid to the age at which children start school, the curriculum provided for them and the overall individuality they

display on the spot. Recent concern has been given particularly to the children with difficulty in adjusting to school (Barrett, 1986).

In investigating the transition from pre-school settings to the reception class in infant school, Cleave et al. (1981) found discontinuities in children's experiences in the first week, which caused the children certain difficulties. It was specifically indicated that, whether children came straight from home or pre-school institutions, discontinuities of experiences were associated with the setting, with the curriculum, and with the people. As far as the setting was concerned, children had a smoother transition where pre-school and infant settings were comparable in scale, in range, and in allowing free movement. Discontinuities of children's experiences of the curriculum existed in four aspects. It was revealed, first of all, that they might vary in terms of perceived aims, and the role of staff in different types of pre-school provision, the coverage of materials and the way they were used. Secondly, differences in children's experience of curriculum provided existed due to a variety of activities in nursery education provision. It was shown that reception classes usually contained some of the essential provisions, such as a home corner, sand play, and floor toys. The daily programme was identified as the third critical feature related to the children's experience of curriculum. It was reported that, at infant school, the newcomers were confronted not only with a wide range of materials but also controlled access to them. The day was segmented into specific activity periods and there was an explicit distinction between work and play. It was also indicated that some periods were set for programmes which were new to children. Playtime was set as a regulatory break in the infant class when the children played in the playground rather than the more flexible indoor-outdoor play implemented in the most pre-schools. Furthermore, it was found, at the infant school, that there was a remarkable decrease in the motor activity and a substantial increase in activity in literacy and numeracy. Discontinuities were likely to be greater for the children with experiences of only limited kinds of activities, for instance, those who were not used to handling equipment like books and pencils, scissors, crayons and paint. Problems were also found among children who had learned to write words and numbers in a way different from that required by the school. Finally, children at infant school did not have as much freedom to choose the activity in which they engaged as they did in pre-schools. Children at home had most freedom to make choice but across a modest range of activities; others in pre-schools had free

choice of a wider range of activities for about half their time, but it was reduced to a quarter of the time at infant school.

In respect of people, children encountered more people than they hitherto did before starting school. The greatest change was in sharing an adult with many others. It was also shown that a large number of children and adults in a school imposed situational constraints on both school and class which had a profound impact on the new entrant. There were seven critical features described as the influences on the experiences of new school-starters: (1) contacts with a number of older, bigger and naughtier children than themselves at playtime and dinner time; (2) attendance of unfamiliar adults remote from the classroom in public gatherings in particular; (3) organisational procedures which required lining-up, queuing, and waiting; (4) competition for adult attention which led to limitations to individual contacts with an adult; (5) being dealt with as a group or a class; (6) constraints on movement and noise and access to interactions with others in terms of behaviour; and (7) organisational constraints on time, being the last, or lagging behind. Case studies showed that there was a variety in the degree of children's psychological responses to the new encounter such as bewilderment, shyness, distress, impatience, and apathy. It was concluded that greater discontinuities were likely to be found among those who started school straight from home, or those who had been with a minder or in a very small nursery.

### **2.3.3 The infant/reception class**

Compared with recent focus of literature on adjustment to school from a psychological standpoint (Hughes, et al. 1979) and looking at practical matters (e.g. Taylor, 1971; Yardley, 1976), other work provides a picture of contemporary infant classrooms from a sociological perspective. King (1978) attempted to analyse infant classrooms in terms of the meaning teachers assigned to their actions. Overall, he found that the teachers constructed the reality of everyday life in their classrooms through various kinds of activities based on their definitions of the nature of the child. The teachers also built up the world of experience for the children mainly through creating a "story world" of reading, writing, and number work. It was indicated that the children learned to recognise and hold the same views on the nature and meanings of these activities and actualised them by reading them loudly, writing what the teachers defined proper, and solving the mathematical

problems presented. Also, the children learned to distinguish the real-life world and the "story world" through the relevance of specific representations to their work. It was also found that a great deal of effort was made to discipline the children to be quiet, busy, tidy, helpful, nice, and polite. As King observed, the teachers' typification was based on five aspects: family conditions (semi-public knowledge), pathological state (private knowledge), compliance with rules (public knowledge), learning progress (semi-public knowledge) and peer group relations (public knowledge). It was found that the institutionalised ideology of child-centered education led the nature of the teachers' typification and assessment to be common across all the classroom observed. The teachers were seen to assess the children's progress in terms of the levels at which the children reached by books and work-cards they went about. As far as the 3Rs was concerned, reading was given "paramount importance" and reading ability was recognised as prerequisite for doing many of the number tasks.

The study by Bennett et al. (1984) involved a close examination of infant education from the perspective of the teachers, and the children, and also looked at various contextual variables. This study was specifically set up to explore the task process in all aspects of language and number work in classes of 6 and 7 age of years. Bennett et al. developed a category system, initially evolved from the theme of Donald Norman's theory of complex learning (1978), for identifying the types of the tasks in terms of "cognitive demands" involved, as shown in Table 2.1 below.

<b>Task demands</b>	<b>Chief characteristics</b>
Incremental	Introduces new ideas, procedures or skills, demands recognitions, discriminations.
Restructuring	Demands a child invents or discovers an idea for himself.
Enrichment	Demands application of familiar skills to new problems.
Practice	Demands the tuning of new skills on familiar problems.
Revision	Demands the use of skills which have not been practised for some time.

*Table 2.1 Types of Task Demand (p.26)*

It was found, first of all, that revision tasks dominated the initial weeks of school as the teachers identified where to begin and incremental and practice tasks came to take part subsequent. It was seen that the teachers emphasised procedural rather than intellectual objectives, despite the differences in their source, presentation, specific demands, and structure. More specifically, the teachers were keen on presentation and production of the work, rather than on the identification and discussion of intellectual procedures. Secondly, it was noted that the teachers gave a large proportion of practice and revision tasks to the high attainers and only a small proportion of tasks involving the application and extension of new knowledge. For example, the high attainers were seen to experience 80% more practical tasks than intended by the teachers and fewer tasks given to facilitate the acquisition of concepts. The low attainers encountered an approximately equal proportion of incremental and practice tasks but lacked opportunities to structure underlying elements. The quality of children's learning experiences was defined in terms of the match between the task demands for intellectual operations and the levels of the children's attainment. It was concluded that a third of tasks were too difficult and slightly more than a quarter were too easy for the children.

#### **2.3.4 Starting school**

As we have seen, there are many differences in demands between home, pre-school and school. It is clear that school imposes unfamiliar and particular demands upon the children who relate their previous experiences and existing knowledge to the components of the demands. There is thus a gap between what children know and what is expected of them when starting school - the bigger the gap, the more difficulties encountered in starting school. To bridge this gap at the beginning of school, Barrett (1986) has suggested that children ought to acquire "survival skills" which enable them to know, learn and act properly as soon as possible. These skills were identified as knowing: (1) who the people including the teacher and other adults were, what they were for, and what they could do; (2) the purposes of the experiences offered for them; (3) a right to their own interest and knowledge; (4) the meaning of school and its physical terms; (5) how to be with, take into account and communicate with other children and adults if necessary; (6) how to help themselves in activity schemes, and (7) how to cope with and overcome failure in knowing things and the feelings this arouses. The progress made by the children was seen in the shift from "not knowing" to "knowing", and from "not involving" to

"involving". It was stressed that, lacking the above knowledge caused children uncertainty, confusion, and loss of control. Success in responding to school situations relied on the degree of match between these experiences and classroom expectations. The teachers recognised that pre-school experiences did lay the foundation for the acquisition of seven knowledge domains. A stable family was also described as offering a firm base of those required knowledge domains.

There were also important findings specifically illustrated in case studies. First of all, the children did not know the expectations the school and teachers imposed upon them. They had to learn the ways and structures of the teachers' thinking and acting and about other children in the first week under circumstances in which many things were unfamiliar to them. It was further indicated that, in addition to learning how to make contact with others, the children ought to find out the way in which they could initiate things themselves for both given purposes and their own purposes. Also, limited experiences and abilities were seen to trap the children into the immediate interpretations which might be irrelevant. Marked differences in physical attributes were found among the children. Some were hearing-impaired with the problem of clear articulation and a few could not make certain sounds. Several children were described as lacking the manual control needed to engage in specific activities such as writing and dancing.

Following the above revelations about the nature and characteristics of the demands distinctively inherent in reception and infant classes, the next section summarises the studies on academic learning and tasks which are given paramount importance in reception classes in Taiwan.

## **2.4 Academic thinking, learning and performance**

### **2.4.1 Academic and everyday thinking/cognition**

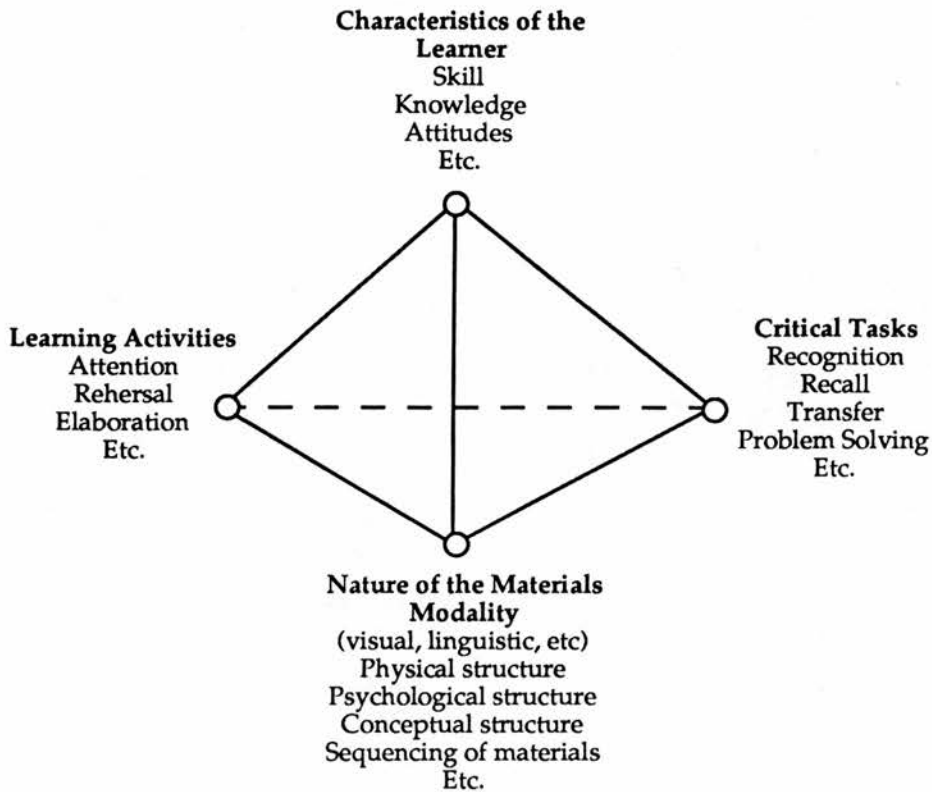
It is argued that linking academic knowledge with real life can consolidate a body of ideas accessible to memory and motivate students to pursue associations with relevant contexts (Entwistle, 1990). Reeve (1987) attempts to explain the difficulties encountered by students in the academic areas of school from the perspective of a distinction between everyday and academic thinking. It is argued that students' difficulties result from failure to make distinctions in intellectual resources between

everyday and academic thinking. Everyday thinking, based on routine episodes undertaken automatically, is characterised by intuitive knowledge which does not necessitate intentional instruction and motivation to learn. In contrast, academic thinking is required to achieve precise outcomes, to develop accurate understanding, and involves strict rules for processing the facts provided. These requirements are claimed to be hard to learn and require a properly-arranged and explicit structure of learning experiences provided in the instructional context. At school, children's thinking is frequently occupied with the demands of completing a large amount of academic materials in prescribed modes which are quite different from everyday experiences and contexts. Children face greater demands for both strict accuracy, and rigid norms, for procedures other than those experienced in everyday encounters.

Brown et al. (1983) characterise academic cognition in terms of three distinctive phenomena. First, the learner is usually deliberately involved in the activity or process which demands strenuous application of "cognitive efficiency": academic cognition is therefore both time- and effort-consuming. Second, outcomes of academic learning are measured by the school and teacher largely in terms of individual competence rather than social capability. Thus, academic cognition is primarily an individual-based efficiency. Third, academic cognition essentially deals with so-called cold matter, such as knowledge, strategies and skills induced and operated by mental efficiency. In other words, academic cognition is much less concerned with the social and emotional factors that might also affect mental efficiency.

#### 2.4.2 Academic learning tasks

Brown et al. (1983), set up a conceptual model, the so-called "tetrahedral model", developed as an organisational framework for exploring the nature of academic learning. It is posited that there are four fundamental features which underlie academic learning: (1) the characteristics of the learner; (2) the learner's activity; (3) the nature of the material to be learned and (4) the criterial tasks. Brown et al. suggest that these four features should be taken into account altogether, whichever features of children's learning is examined. Figure 2.1 demonstrates the components of each integrated feature and their interrelationship and dynamics of these four facets underlying children's learning through academic tasks.



*Figure 2.1 An organisational framework for exploring learning (p.85)*

Blumenfeld et al. (1987) point out that academic tasks vary in content and form. They argue that task content includes the objectives students are expected to achieve and the subject matter they have to cover. Different objectives involve different levels of intellectual processing and prerequisite skills, which affect students' learning and performance. The subject matter affects students' perceptions of interest, familiarity, and difficulty. Blumenfeld et al. also categorise elements of task forms into three domains: the activities, the products, and the social organisation in which the tasks are undertaken. They believe that task forms direct how the student initiates and thinks about new information by relating previous experiences and existing knowledge to the task content.

The gap between a lesson's cognitive objectives and its perceived evaluation is thought to be the plausible reason why many students neither pay attention to lessons nor use cognitive skills they acquire to process information given to them. It is argued that cognitive operations decide difficulty levels of task content while the



complexity of task forms determines students' difficulties in doing the task. Figure 2.2 demonstrates task elements identified by Blumenfeld et al.

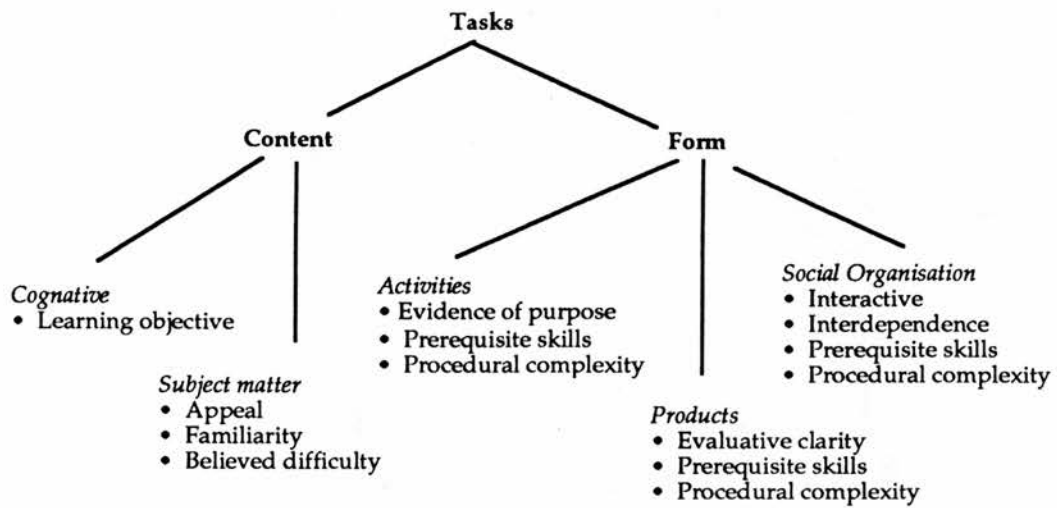


Figure 2.2 Task elements (p.138)

Flavell and Wellman (1977) argue that children have more difficulties in carrying out tasks in primary classrooms when they have to: (1) remember unrelated item sets rather than related ones; (2) remember a large rather than small number of items; and (3) operate under great time limitations rather than being given a long time to process information. Flavell and Wellman's emphasis on the role of memory in task performance obviously fills out the models discussed above by stressing the importance of children's on-the-spot mental processes and capacities to work on the information.

Of the tasks school-age children cover when starting school, language and mathematics comprise the main stream of the learning tasks, and language is given paramount importance. The following section then presents and discusses relevant studies on beginners' work on language and mathematics tasks.

## 2.5 Learning and performance in language and mathematics of early schooling

### 2.5.1 Learning and performing the language tasks

#### *School language*

The 'deficit model of language competence' prevailing in the early 1960s led researchers to endeavour to explore the language used in the school and classroom (French, 1987; Woods, 1981). Since then there has been a wealth of evidence showing that language competences are of great importance as far as school success is concerned. As mentioned previously, home plays a vital role in children's language development which does not stop at the age before starting school. In fact, during the school years, children both continue, consolidate, refine, and expand, their language abilities acquired earlier at home. However, differences in language modes and contexts between home and school affect the extent and scope of difficulty encountered by children entering school.

As Shuy (1984) concludes from a review of the literature, the language curriculum has been based on principles of reductionism. Reading and writing, in particular follow the ideal that language can be best learned and produced by processing small linguistic components sequentially, i.e. the synthetic approach. Under such circumstances, as Shuy indicates, children are deprived of opportunities to learn how to ask, and respond to, questions, to proceed with interactive communication for social and particular reasons, to present themselves verbally in public, and to take part in collective activities in various contexts. Shuy identifies six characteristics of learning language at school in the synthetic approach: (1) a reductionist activity; (2) starting with a focus on form rather than function; (3) teacher-directed rather than children generated; (4) an artificial encounter; (5) the requirement of formality; and (6) evaluation-bound. However, for Shuy, these facts run counter to language that has been used in various contexts besides school. In contrast, the analytic approach follows the spirit of the philosophical arguments of Kant and Wittgenstein that a whole context of language is the best starting point of explorations of what is going on and how it is so. Children guided in this approach are actively involved in the immediate context and construct the relevant wholly realistic picture with as much available information as possible. New information

about how school language works leads Shuy to suggest that language learning in school proceed as a functional, self-generated and contextually relevant activity, if school education is not intended to reduce children's "humanity to a predictable, dull sameness." (p.173)

Perera (1982) identifies three areas in which children are more likely to have difficulties, as far as the formal academic school language is concerned: (1) in making sense of what the teacher says; (2) in understanding what is said in textbooks and work-cards in subjects; and (3) in writing properly about academic topics. Perera specifically pins down three causes for difficulties leading to misunderstanding of oral language. First of all, the vocabulary is so unfamiliar that the child has not encountered it before, particularly those words which are "archaic" or "unusual". Secondly, the teacher provides explanations accompanied by a pointing gesture which distracts the child from the actual reference of the explanations. Thirdly, the teacher uses grammatical constructions that the child does not interpret accurately. Perera argues that formality of written language is the main cause for children's difficulties in understanding the language of textbooks and work-cards. This creates more pervasive and more serious difficulties than any created by the teacher's oral language. She further points out, that written language cannot be accompanied by facial expressions or pointing gestures which provide the child with more clues of understanding. More significantly, the written language cannot react to any salient misunderstanding on the child's part in the way that the teacher can. For Perera, the teacher's language of instruction is the mainstream of classroom language. She suggests, moreover, that the teacher's language may be a barrier to learning where the teacher uses terminology or an abstract style of language with which the pupil is unfamiliar.

These findings explain why the analysis of classroom discourses has become important in contemporary educational research. French's review (1987) categorises distinctive characteristics of classroom discourses between teachers and pupils in three areas. First, teachers talk most of the time. Second, turns in talking are pre-allocated and pupils are generally asked to speak instead of participating spontaneously and appropriately. Third, and more significantly, the teacher's talk primarily contain two parts: questions posed to pupils, and subsequent evaluations of pupils' answers. Pupils are mainly required to give answers to questions rather than to set out topics or questions for themselves. It appears clear that, inside



classrooms, the three-part sequence, i.e. question-answer-acknowledgement is a dominant form of teacher-pupil interactive discourses (French, 1987; Wood, 1988). Blank et al. (1978) emphasise that teachers' questions are important instruments for stimulating pupils to learn and think. However, having reviewed many relevant studies, Wood (1988) concludes that teachers' questions are inclined to be closed-ended statements with fixed accurate answers. He specifically points out that children say little and become accustomed to responding in a predetermined framework and to give expected replies as a result. Overall, classroom discourses serve mainly two purposes (French, 1987). One is to provide the teacher and pupils alike with immediate feedback of what has been heard, grasped, understood, and interpreted, from which better explanations can be provided and specific corrections can be made. The other is to monitor and control discipline and order of classrooms, more fundamentally, to draw the attention of the whole class and to counteract the overwhelming desire to participate on the pupils' side. Woods (1981) specifically identifies four types of communicative modes and acts used in instructional discourses which are aimed at stimulating learning and understanding. "Requestives" serve to solicit information or actions, "regulatives" function to construct and regulate the flow of conversations, "assertives" provide information, while "responsives" give solicited information or new information in relation to the previous requestives or assertives. He further suggests that instructional discourses be organised in three ways: how to mean what is intended to say, how to and when to participate, and how to be relevant, clear, and original.

As a natural consequence of language development, the vast majority of children can master oral communication, as they grow, without intentionally directed help, while mastery of written language by reading and writing do require specific guidance intentionally and systematically given at school. How such help is organised to enable children to learn to read has been the focus of many research studies, which are summarised in the following section.

#### *Learning to read in general*

It is widely acknowledged that reading and writing are acquired not just simply as a result of maturity or of experience in social contexts. Few children learn to read without instruction, and children of average ability learn to read rather slowly, and with difficulty, even though they receive explicit, intentional, and strenuous

instruction every day (Gough & Hillinger, 1980). As early as 1967, Chall points out that reading difficulties and failure stem from initial teaching and from various characteristics of the child. Teaching methods and approaches to beginning reading can be classified into a meaning-emphasised approach (a whole word) and a code-emphasised approach (phonics). Chall concludes that a code-emphasised approach assumes that beginning reading is essentially different from skilled reading and such an approach leads to better results in early years of schooling.

Over past decades, many theoretical analyses have been made to identify the process of reading and learning to read, in particular, in order to suggest more effective instructional methods. Chomsky's theories are clearly reflected in Goodman's arguments (1966, 1970) that learners have innate competence which leads them to detect deeper meaning through means of grammatical and semantic mechanism when reading (Pidgeon, 1984). Vygotsky (1962) sees reading as a difficult process which requires children's conscious attention, in comparison to speaking and listening which are spontaneous activities. More specifically, Mattingly (1972) contrasts the easy acquisition of oral language with the explicit difficulties of learning to read, and suggests that reading, as an intentionally acquired language-based skill, is subject to the speaker's awareness of certain features of primary linguistic activity. Resnick (1987) regards reading as a higher-order skill and a process which encompasses a combination of what is written, what the reader already knows, and various kinds of general cognitive processes (e.g. making inferences, noting connections, checking and organising) to build up a plausible idea of what the writer presumably has in mind. Pidgeon (1984) summarises Downing's theory (1979, 1984) of the process of reading by suggesting that it consists "in the rediscovery of (1) the functions and (2) the coding rules of the writing system." (p.178)

Of the formulations of the process of reading, Gough and Hillinger's (1980) is the more complete and detailed. They point out that learning to read starts by children setting up an arbitrary correspondence between targeted features of printed words and their spoken counterparts, and this leads each additional word to be more difficult to acquire. To sustain a sequence, as they put it, the children then have to acknowledge that the correspondence between printed words and their familiar spoken word is not arbitrary, but linked by a complicated cipher. To learn to read, Gough and Hillinger suggest that children break this cipher by a method related to

crypto-analysis. In other words, to do so, children ought to recognise the basic units of the ciphertext (the letter which makes up the word) followed by recognition of basic units of plaintext (decomposition of a spoken word into constituent phonemes); and they must get enough messages for themselves to discover the ciphertext-plaintext correspondences. They hold that children can read when succeeding in these unnatural processes and acts.

The process of integrating clues to good effects is found in a study of reading of seven-years-old undertaken by Biemiller (1970). It was indicated that some of the children progressed very rapidly from an initial reliance on prediction, which led to many response errors, to a stage of non-response errors - a stage where they kept quiet when confused and attempted to bear on their phonic knowledge. As seen, it was this kind of child who made the best progress, eventually reaching the third stage, where they were able to use clues of both kinds with fewer overall errors.

Pidgeon (1984) argues that many children cannot read, on occasions, because they fail to remember a special correspondence, but more frequently it is because they do not have clear ideas of what they are expected to be doing. There are several important points which come out of Pidgeon's close examination of teaching reading across reception classes. First of all, there are too many prerequisites, inadvertently set by teachers in teaching reading, such as left-to-right directionality, the orientation of letters, the segmentation of sounds into letters, the purpose of reading, and the fact of written-and-spoken-word correspondences. Secondly, the amount of learning is far too heavy for many children who are not well equipped with early language experiences. Pidgeon emphasises that these pupils are then confused, with little awareness of what it is they are required to be doing. Thirdly, teachers are inclined to be simply concerned with teaching children to read, rather than helping children learn how to read. Pidgeon explains that learning to read can simply mean learning correspondences between printed marks on paper and a special sound, or a series of marks and a prescribed meaning, whereas learning how to read involves understanding of the essence of the process of being linguistically aware. Fourthly, children's reading ability and progress is primarily evaluated by reading schemes. Pidgeon demonstrates that many teachers are under great stress from either parents or colleagues to make their pupils read, and this frequently gives rise to more attention to associative learning by rote, at the expense of the acquisition of real and clear understanding of how the process of

reading really develops. In consequence, pupils rush to perform a task called 'reading' when they have ideas of the nature of the task, being unaware of the relationship between what they are doing, and understanding and speaking their own language. Fifthly, few teachers systematically assess beginners' current knowledge of the process of reading, but tend to depend on intuition about when and how to start instruction. It seems common for teachers to ignore a wide range of children's previous language experiences, motivation, and learning ability, which enable children to initiate the process of reading. Pidgeon further points out that teachers, who can not effectively plan and implement their reading instruction or cope with large classes of pupils from disadvantaged or different linguistic background, undoubtedly perform poorly. In this case, Pidgeon refers to Southgates' argument (1972) that "children will fail to learn to read in infant classes unless a good deal of guidance and instruction is undertaken by the teacher." (p.39) There are some children who "would neither be "motivated" nor "ready" by the time they were eight or nine or ten, if someone did not do something about it." (p. 39) For Pidgeon, motivation to learn to read is rather low, bringing about frequent "lapses of attention". Two sources are identified as causing children difficulty in concentration when learning to read. One is the fact that reading programmes are so remote from children's previous experience and background that they do not provide children with sufficient and necessary connections and expectations. The other is the fact that pupils are unable to understand what they are required to do and thus fail to recognise how and why they have to do it. Consequently, as Pidgeon puts it, children cannot make sense of the tasks and have little expectation of success in doing them. Pidgeon explains that reading is predominantly regarded as a cognitive-specific task and therefore little attention is paid by teachers to its affective aspects. It appears as an "unbroken vicious circle of inability to concentrate, leading to failure which promotes a negative self-image reinforcing the inability to concentrate". (p.182) Finally, teaching is invariably from sight to sound. Regardless of teaching approaches to reading, as Pidgeon indicates, pupils are confronted with a graphic symbol and then given the sound which corresponds to it. It appears as a well-recognised fact that almost all children learn to speak their own language first before they learn to read, and hence awareness and knowledge of the spoken language must come before any activity related to learning to read. It is thus understandable that meaning is conveyed through auditory modes. It is evident that the difficulties and failure children have in learning to read result to a

large extent from this unnatural processing of linguistic representation and gaining meaning. Pidgeon (1979) suggests that, based on this natural development of language, it would be more sensible to learn to read from sounds to sight instead of the other way round.

In respect to children's own qualities, specific visual difficulty rooted in neurologic defects is identified to block reading processes (Byrant & Bradley, 1985). Under such circumstances, the children are confused about the direction of letters and words in addition to general visual deficits where the children are particularly bad at receiving and remembering the shapes. Bryant and Bradley also point to cross-model deficits which account for backwardness in learning to read, in the sense that the children are unable to understand the association between all types of perceptual modes taking place at the same time. Bakker (1967) argues that poor memory holds children's reading back. Vernon (1957) points out that cognitive confusion is a prime cause of children's failure to read. She specifically stresses that the primary problem of reading is a failure in the development of the reasoning process.

Besides effects within the school, family background is given prominence where there are difficulties in learning to read from the perspectives of language contexts. In general, children from a cultural background and life experience, which are different from that illustrated in the materials they read are likely to experience unusual difficulties in learning to read (Bond, et al., 1979). Children whose spoken language or dialect differ from that of the teachers, or from standard language used at school and in the books, are likely to find it demanding to learn to read (Bond, et al., 1979).

Having examined literary behaviour and orthographic knowledge displayed by a group of children setting about the tasks of reading and writing in their own ways through their first three years of school, Francis (1982) identified three types of young readers. The skilled readers had some understanding of reading and writing in their own right, set themselves to listen and read, actively engaged in communications which were the sources of learning, were able to ask questions, explain and set out alternatives and provide key points to some extent. The slow readers perceived reading and writing as something special to starting school, instead of a necessary skill or ability for everyday life. The later beginners were



those who did not show any sign of being able to read in the first year in school and had great difficulty in reading after three years. In fact, more specifically, these children gave no indication of their understanding of what reading and writing was all about. They came to learn by receiving and copying representations given to them but without understanding. More significantly, they were often found to lack support from family.

In summary, learning to read is a matter involving multidimensional and complex processes and acts. As Bond et al. (1979) put it, the difficulties in learning to read are related to visual and auditory deficiencies, poor health and brain damage, emotional and social maladjustment, lower than average ability to learn and think (intelligence), and inadequate language competence and comprehension ability. Educational factors also account for reading difficulties, such as lack of individualised teaching reading which pays special attention to reading readiness, ineffective and inappropriate teaching, too rapid progress through teaching schedules which give no time to children to process the information, and failure to base the new reading skills on children's previous experiences. The process, difficulties and causes of learning to read in English described above can also be applied to learning to read in Chinese phonetic symbols rather than Chinese characters in principle. But the special nature and demands of the Chinese language as a whole, mean paying special attention to the specific problems involved in learning to read Chinese.

#### *Learning to read in Chinese*

It is well recognised that reading different scripts requires different processing strategies, and failure to develop these distinctive strategies to achieve proficiency in reading is likely to cause problems (Hung & Tzeng, 1981). Although a large number of Chinese characters are made up of semantic component (called the *signific*) (Kenneth, 1986) by which Chinese readers get clues of the meaning of a character and a phonetic component which indicates its sound, Chinese logographs are essentially based on spoken language at the morphemic level of which one-to-one grapheme-morpheme relations bear on distinctive characters associated with each other. As a result, as Hung and Tzeng(1981) put it, one must learn and remember thousands of these distinctive characters before one can read. Hung and Tzeng further argue that, although almost all who learn the Chinese language find

that writing is a time- and energy-consuming, tedious and slow task, the close relationships between grapheme and morpheme segments composed of a character make processing of visual discriminations and homophones more explicit and easier for children than English.

In Chinese language scripts, morphemes underlie the spacing and each morpheme is virtually a syllable (Tzeng & Hung, 1981). The word *library* has three morpheme in Chinese (picture-book-building) and is thus made up of three characters and sounded as three distinctive syllables. In perceptual terms, the grapheme-sound matching in Chinese is discrete (each character is also a syllable) whereas in English script such a relationship is continuous and at a more abstract level (Hung & Tzeng, 1981). For Chinese young readers, as Hung and Tzeng argue, the written representations are detached syllable by syllable and therefore they have clear one-to-one association with syllabic boundaries of the spoken words. Earlier, Tzeng and Hung (1981) pointed out that reading in Chinese, as a logographic script, is concerned more with expressions of single special morpheme than grammatically-united elements. They emphasise that the character remains the same despite altering syntactic elements (e.g. *I want eat* instead of *I want to eat*). Therefore, under such circumstances, for Chinese children learning to read, it is simply a matter of learning to make each spoken syllable correspond to a particular character of a prescribed meaning. In Taiwan, literacy is highly valued and social pressure leads schools to be sensitive to their public image. Even simple informal surveys on reading performance are not usually made, and even when available, they never tell the whole story. Above all, it is clear that, as Hung and Tzeng (1981) argue, the primary difficulty in learning to read Chinese results from its prerequisite for knowing a large number of distinctive characters. It is also suggested that visual processing is more significant in Chinese because of a lack of regular and fixed grapheme-phoneme relations in the morphemic scripts (Woo & Hoosain, 1984).

A study conducted by Stevenson et al. (1982) found that the Chinese children in Taiwan had less difficulty with vocabulary tests and more difficulty with comprehension tests. It is in part because children receive the repetitive drill practices to master script-sound-meaning associations of huge numbers of characters, giving rise to habits of rote memorisation (Hoosain, 1986). The above arguments and studies on the nature and characters of Chinese language in relation to beginning reading have revealed that the ability to learn to read requires

perceptual discrimination of large numbers of different written forms. It is clear that it is easier to learn to read in Chinese starting with clear grapheme-morpheme associations in characters rather than script-sound relations mapped on the spoken language in phonetic symbols. It is mainly because access to single characters does not require any grapheme-phoneme translation and also there is no certain association in graphemic representations between the systems of spelling sounds and forming words that children can grasp and follow.

As a matter of fact, the Chinese children in Taiwan are at a disadvantage and encounter more unnecessary difficulties in learning to read in the sense that teaching practice and the writing system run counter to the nature and characteristics of the Chinese language.

## 2.5.2 School mathematics

### *Acquisition of knowledge and skills of mathematics*

Piaget has been recognised as one of the leading theorists on how children learn mathematics, based on his empirical studies of young children's understanding of mathematical concepts (Hughes, 1986). Piaget (1952) argues that until 7 years of age children neither conserve numbers nor are able to compare a set with one of its subsets. He also points out that understanding class-inclusion is a primary prerequisite for understanding addition and subtraction. Drawing on his theory of stage of development, Piaget puts forward an idea of how mathematics is learned. He says that

It is a great mistake to suppose that a child acquires the notion of number and other mathematical concepts just from teaching. On the contrary, to a remarkable degree he develops them himself, independently and spontaneously. When adults try to impose mathematical concepts on a child prematurely, his learning is merely verbal; true understanding of them comes only with his mental growth.

This can easily be shown by a simple experiment. A child of five or six may readily be taught by his parents to name the numbers from 1 to 10. If 10 stones are laid in a row, he can count them correctly. But if the stones are rearranged in a more complex pattern or pile up, he no longer can count them with consistent accuracy. Although the child knows the names of the numbers, he has not yet grasped the essential idea of number: namely, that the number of objects in a group remains the

same, is "conserved", no matter how they are shuffled or arranged. (1953, p.74)

Here Piaget demonstrates his essential idea that development and acquirement of mathematical knowledge is reached as a natural consequence of general intellectual development. Compared with the behaviourists' views, Piaget's implies the active role children play in constructions of their own knowledge, in conjunction with nature and stage of development of the innate intellectual structures (Hughes, 1986). However, the Piagetian approach has been generally criticised for inferences about children's inabilities, based on failure to perform experimental tasks of which composite elements are made up in the way remote from children's experimental world and their own language forms (e.g. Donaldson, 1978). One of the limitations of Piaget's theory of how children develop their number concepts is his underestimation of quantitative skills such as counting, estimating, and subitising (In terms of Carpenter & Moser's definition (1983), subitising means directly perceiving the numerosity of something, thereby making it unnecessary to count).

In respect of early arithmetic cognition, Klein and Starkey (1986) identify three types of knowledge underlying young children's arithmetical thinking: enumerative processes, computation procedures, and knowledge of the natural number system. Enumerative processes involve the psychological processes children operate to derive numerical representations of sets of concrete or imaginary objects. There are three enumerative processes occurring during early childhood: subitising, corresponding, and counting. Computational procedures are operated to perform arithmetic computations on their numerical modes of sets of objects in line with an assumption that every enumerative process is associated with a class of computational operation that develops along with the course of development of early childhood. Knowledge of the properties of the natural numerical system includes numerical relations (e.g. equivalence), arithmetic operations (e.g. addition and subtraction), and arithmetic axioms (e.g. equal added to equal yields equals).

Recent research on mathematics learning has suggested a "paradox" (Resnick, 1987). There is a wealth of evidence that young children develop rather "robust, although simple, mathematical concepts" (p.421.) and strategies. Children can apply these knowledge and skills in various kinds of practical situations in everyday life before going to school, which may not be in line with underlying demands, representations and the way experimental tasks and learning materials are

undertaken at school. School mathematics is found to be very difficult to learn for many children. It is necessary to explore how children acquire mathematical knowledge and skills before starting school, and their relevance to the nature of school mathematics, in order to explain their difficulties in learning mathematics at school.

According to Resnick's review (1987), children's first, and best developed, mathematical competence is counting. Young children are found to be able to use counting to solve informally various kinds of arithmetic problems, including problems that they have difficulty with at school. It is also indicated that children gain implicit understanding of several basic arithmetic principles in examination of shortcut procedures invented by them. Resnick further points out that children, at 7 years of age, solve subtraction problems by either counting down from the larger number or counting up from the smaller number, whichever requires the fewer counts. This implies that children have implicit knowledge of the "complementarity" of addition and subtraction. Resnick concludes from an examination of many of these examples that children have developed an intuitive understanding of many basic mathematical principles early and this finds its expression in a large variety of practical problem solving tasks.

As revealed above, the home is a potent learning environment of language before children start school and this is true also in the case of learning mathematics. Young-Loveridge (1989) examined the relationship between children's home experiences and their mathematical skills on entry to school. He found that children brought to school a variety of experiences with numbers and these appeared to be concerned with their knowledge of number concepts. It was shown that number experiences involved domestic activities such as baking, shopping; games such as Bingo, dominoes, Pokes, Monopoly; experiences of using calculators and money and experiences with time like using calendars, clocks, and car speedometers. High-level performers were noted for their familiarity with a wide range of encounters involving numbers, strong and active attitudes of the family members towards numbers, the opportunities to observe their mothers using numbers to solve everyday problems, and higher expectations of parents for mastery of skills. In contrast, low-level performers were found to be characterised by fairly limited experiences, an orientation held by their family members towards literacy instead of numeracy, little opportunity to observe their mothers using numbers to solve

everyday problems of their own, and relatively low expectations of parents for proficiency in skills.

The interpretations of numbers in terms of relationships between part and whole is the fundamental concept children are expected to acquire in the early years of school (Ginsburg, 1983). Holding on to this major conceptual achievement, school-age children can solve the mathematical problems and make interpretations of number relations. As Marton & Neuman (draft paper) indicate, there appears to be similar view that children begin by modelling basic addition and subtraction problems physically, giving prominence to manipulations of concrete objects and pictures, then being involved in mental counting strategies, and finally coming to absorb factual information about numbers, which they can retrieve from long-term memory. They conducted a study with 82 Swedish school-starters and the findings appeared to question this general view of acquisition of arithmetic skills. It was found that, instead of dependence on the use of the algorithmic or semi-algorithmic operations, children were inclined to develop an immediate insight into numbers and number relations by means of visualising these representations through mapping them on particular finger patterns.

Hughes (1986) specifically presented a number of cases and exemplary demonstrations of impressive mathematical competences young children exhibited before starting school. He indicated that most young children could do addition and subtraction by counting strategies with fingers and set up their own ways of marking written numbers by notations primarily based on the principle of one-to-one correspondence of objects and symbols. It was suggested that young children entered school with a body of knowledge, understanding and skills which brought about learning and interpretations of different formats of mathematics at school. The relevance of previous experiences and demands of currently-encountered knowledge and skills has increasingly been given prominence in achieving optimal learning and performance on mathematical tasks.

#### *The nature of school mathematics*

Having looked closely at recent research on mathematical cognition, Resnick (1987) found that in mathematics, as in reading, "successful learners understand the task to be one of imposing meaning." (p. 421) By imposing meaning, Resnick means doing interpretations rather than routine manipulations. Yet, "making sense of formal

symbols and rules that are often taught as if they were arbitrary conventions rather than expressions of fundamental regularities and relationships among quantities and physical entities." (p.421) Resnick highlights that this difficulty can be reduced or avoided by teaching basic mathematical skills in a way that closely relates to children's intuitive knowledge and capacities for imposing meaning.

Hughes (1983) regarded school mathematics as the formal code of arithmetic which involved two essential characteristics every child had to appreciate: context-free expressions (e.g. such a statement as *three and five makes eight*) and written symbolism (e.g.  $3 + 5 = 8$ ). These two points were described as distinguishing school mathematics from the informal mathematics acquired before entry to school (Hughes, 1986). According to Hughes' analysis of relevant studies and his own findings, starting to learn mathematics at school involves a transition of subtle and interrelated composites incorporated in the same knowledge and skill domains, such as from practical to hypothetical contexts, from concrete to abstract representations, from spoken to written language, from embedded to disembedded thought, from objects to words and then to symbols, and above all, from the informal to the formal. Hughes argued that to solve practical mathematical problems entailed the capability of manipulating the formal codes but also adequate translations between formal and concrete modes of the same problem. He found that many difficulties the children had in solving mathematical problems lay in their reluctance, or inability, to translate between formal and concrete modes.

#### *Difficulties in learning school mathematics*

There has been a great concern for children's difficulty in learning mathematics in school. Many studies suggest that children's difficulty in learning school mathematics results largely from "their failure to recognise and apply the relations between formal rules taught in school and their own independently developed mathematical intuitions." (Resnick, 1987, p.422) Hughes (1986) argues that both the written modes and context-free nature of the formal codes of mathematics' language cause substantial difficulties to children entering school. Children face a new kind of language, the language of mathematics, of which its unfamiliarity and lack of concrete referents, are considered to be the main cause of children's difficulties. Hughes specially points out that children's difficulties in dealing with arithmetical statements result from their failure to make sense of the symbolic codes, i.e.

difficulties translating the formal and informal representations as posited. The reasons for this occurrence are twofold. One is that, unlike adults, children fail to seize the advantage of making this kind of translation on their own. Yet teachers do not endeavour to convince children of this advantage, in a way closely related to previous experiences of children, because of lack of time and difficulty in developing a fully convincing rationale. The other is that the written symbols initially do not explicitly show to children their utility in real life. Hiebert (1984) summarises American studies and then concludes that

...many children experience difficulty in learning school mathematics because its abstract and formal nature is much different from the intuitive and informal mathematics the children acquire... Much of school mathematics involves representing ideas with symbols and manipulating the symbols according to prescribed rules. Formalization is essential, but it also presents a serious learning and instructional problem. Many children do not connect the mathematical concepts and skills they possess with the symbols and rules they are taught in school. I shall argue that it is the absence of these connections that induces the shift from intuitive and meaningful problem-solving approaches to mechanical and meaningless ones. (p.498)

...Many of the children's observed difficulties can be described as a failure to link the understandings they already have with the symbols and rules they are expected to learn. Even though teachers illustrate the symbols and operations with pictures and objects, children may still have trouble establishing important links. (p.501)

Carpenter and Moser (1983) review relevant research on difficulty in mathematics. There have been no consistent findings, although a tendency is shown that children find the work harder as the number becomes larger. They summarise variations in word problem difficulty in (1) specific measurement of the number of words in the problem; (2) sentence complexity; and (3) syntactic and structural variables. Although the severe criticisms made by Brownell (1941) may be overstating the issue, treating difficulty in a relative terms is very stimulating.

It may be assumed that all difficulty rankings are authentic for the conditions under which they were obtained and for the techniques by which they were determined. And this is precisely why research to ascertain the comparative difficulty of the combinations has been unprofitable. There is no such thing as "intrinsic" difficulty in the number facts; their difficulty is relative, contingent upon many conditions, chief of which is method of teaching, or stated the difficulty,



the number, order and nature of learning experiences on the part of pupils. (p.127)

Having reviewed the relevant arguments and studies lacking consistent and decisive conclusions, Ginsburg (1983) locates children's difficulties in learning mathematics in deficiencies in neurological and environmental conditions, cognitive functionings including attention, memory, metacognition and learning potential, and personality involving self-esteem and motivation. It seems rather encouraging to Ginsburg that effective teaching practices and appropriate textbooks can help children overcome difficulties in learning mathematics to a desirable extent.

*Learning and achievement in the early years of school in different cultural settings*

Cross-cultural studies presented here have been done using quantitative methodologies. They certainly provided insight into differences in the effects of learning contexts however superficial and broad the findings were. Since the subjects involved Taiwan children in the early years of school, it is necessary to discuss the findings in detail. Stigler and Perry (1988), using category systems coding observable episodes, explored practices of, and differences in, children learning mathematics in three cultural settings. The study was undertaken with a sample of 5524 first- and fifth-grade elementary school pupils and teachers in Sandai, Japan; in Taipei, Taiwan; and in Municipality Metropolitan, in the United States. In general, the differences in class size and organisation were found to affect children's learning mathematics in certain respects. Children in Japan and Taiwan classes spent significantly more time in school than did the American children. This eventually led to more time learning mathematics. School was in session for 240 days in Japan and Taiwan, compared to only 180 days in the United States. Japanese and Taiwanese children spent a much larger proportion of their time involved in academic activities. In first grade, 79.2% of their time was engaged in academic activities in Japan, 85.1% in Taiwan, compared to 69.8% in the United States, although most of class time in all three cultures were directed to either reading/language and mathematics. As far as organisation was concerned, classrooms in Japan and Taiwan were virtually centrally united by most activities under the direct control of the teachers, and children spent most of the time watching, listening and working as a class and were seldom divided into small groups. Within organised learning contexts, in which prominence was given to the development of academic knowledge and skills in relation to literacy and

numeracy, there were three aspects identified which directly affected children's learning of mathematics in classrooms: the way of solving problems, the method of evaluating the answers, and the way of arranging activity schemes.

It was shown that three cultural settings varied in the extent to which emphasis was put on performance and practice versus reflective thinking and verbalising the knowledge and skills. The Taiwanese classes were found to be more performance- and practice-oriented compared to the Japanese, which were more reflective. Taiwanese teachers focused on "doing" whereas the Japanese teachers emphasised "thinking". There was no salient orientation shown in the American classes. There was a large amount of oral explanation in a more relaxed pace during mathematics lesson sessions in Japanese classes. The Japanese teachers usually stressed to their pupils that it was the process of problem solving which mattered rather than simply getting the answers right. They tended to slow their pupils down, encouraged them to think about the problem and how to solve the problem, then revealed and discussed their thinking with the class, rather than hurrying on to solve the problem. In contrast, Taiwanese teachers emphasised fast and right performance and getting correct answers quickly. It was found that 17% of all classroom episodes were directed towards practice in rapid mental arithmetic, the activity which never occurred in either Japanese or American classrooms. Both Taiwanese and Japanese teachers relied more on manipulations of concrete objects and real-world problems than did the American teachers. Pupils were exposed to concrete manipulations involving about eight discrete objects and were required to divide them into four groups. Real-world scenarios included word problems and contexts where the pupils were asked to produce a word problem to associate with an equation statement. The second factor affecting children's learning mathematics was located in the way, in which feedback was given to pupils. Three common measures were observed in Taiwan classes. Firstly, pupils' erroneous solutions and reworkings of the problem were shown and done continuously until the accurate solutions were produced. Secondly, pupils reported to the classes the amount of problems in a set of exercises which were correctly solved (e.g. the teachers asked all pupils who solved all problems accurately to stand up). Thirdly, praise and rewards were given to the pupils for their efforts and performance with accurate solutions. In Japanese first-grade classes, it was seen that pupils usually were evaluated through means of exhibiting their errors to the class. These errors were then publicly discussed until the accurate solutions were generated by the class.

Reporting the number of problems correctly solved to the class or teachers was the most common type of evaluation used in Taiwan classes whereas praising was found more frequently among American pupils. For Stigler and Perry, these differences in the way of giving feedback pinned down distinct consequences that Japanese pupils were encouraged to revise their wrong attempts, the Taiwanese pupils were required to let the class know how well they had done, and the American pupils were being assured that they had done a good job.

The connection between one and another activity and logic sequence of interpretation of episodes was said to be the third factor affecting children learning mathematics. There appeared to be a tendency in the Japanese classes for an entire forty-minute mathematics class to be used to find the solutions to only one or two problems. The problem was used to facilitate topical continuity across different segments and purposes as pupils discussed the features of the problem, solved the problems, used the alternative methods, and discussed and evaluated the alternative solution strategies. This kind of coherent and continuous arrangement was not seen in Taiwanese classes. Moreover, it was found that, in the Taiwanese and Japanese classes, the teachers were inclined explicitly to demonstrate the relationships due to take place between different segments within a lesson and between lessons. It was stressed that transition from one to another activity in Asian classes was frequently done by verbal discussions of the relations between two segmented episodes. The classes, as observed, started with explanations of the objectives of the class and how the forthcoming activities related to the objectives. Stigler and Perry's study indicates differences in cultural beliefs about the nature of individual differences, and of learning, leading to different teaching practices. Unlike the Western view that every child's mathematics ability is subject to limitations, Asian people hold a deep belief that all children can, with proper efforts, profit from formal schooling and school can provide high-quality experiences for all children, an ideology behind the uniformity of school curriculum and other provisions and activity structure.

An up-to-date comparative study, *Contexts of Achievement*, by Stevenson and Lee (1990) provided explanations for differences in children's academic achievement in these three cultures from the perspective of socio-cultural conditions. They attempted to uncover the reasons for high academic achievement of Chinese and Japanese children compared with American children. The study was undertaken

with first and fifth graders attending elementary schools in the Minneapolis metropolitan area, Taipei (Taiwan), and Sendai (Japan). There were 1,440 children (240 first graders and 240 fifth graders selected from 20 classrooms in each city) involved in the study. The investigation indicated that a significant difference in mathematics achievement existed between the United States and two Asian countries. It was found that American children did poorly in mathematics during school years compared to Chinese and Japanese children in the application of mathematical principles to the solution of word problems, and in sheer computation. Evidence found on reading achievement was too vague to explain the difference in children's responses to the materials used in the texts.

Five socio-cultural factors were identified which fostered achievement in Asian subjects: daily emphasis on academic achievement, interest and involvement of parents and other members of the family in children's academic achievement, realistic perspectives in evaluations, high standards and expectations of academic achievement, and beliefs in and emphasis on the influence of effort and ability. Overall, background information on the children's everyday lives showed much greater attention to academic activities and subject matter among Chinese and Japanese than among American children. More specifically, children's academic achievement was not regarded highly by American mothers, whereas Chinese and Japanese mothers regarded this as of the greatest importance. From starting school, Chinese and Japanese families endeavoured to help their children by providing them with an environment suitable to promote academic achievement. In contrast, American mothers were less keen on their children's academic achievement, than on cognitive ability in general terms. They tended to provide experiences aimed at facilitating cognitive development, instead of superiority of academic performance. Chinese and Japanese mothers set higher standards for their children's achievement and gave more realistic evaluations of their children's academic, cognitive, and personality characteristics than American mothers. American mothers were more inclined to overestimate their children's achievement than Chinese and Japanese mothers. Having been asked to identify the main reason for their children's academic achievement, Chinese and Japanese mothers emphasised the significance and importance of hard work to a greater extent than American mothers. American mothers laid more emphasis on innate ability than did Chinese and Japanese mothers.

Apart from well-recognised inherent shortcomings of comparative studies of different cultures from perspectives of epistemology and methodology, there are additional limitations in these two studies. First, children's subject-specific knowledge and skills related to classroom activities are untouched. Thus, the studies fail to explain differences in the three cultures in terms of acquisition, processes, and uses of knowledge and skills, and their relationships with outcomes. Second, and more serious, the research instruments, the category system, and achievement tests, were presumed to be ideally developed as tools for unbiased overall comparison, however they could hardly achieve this purpose. Nevertheless, as Hatano commented (1990), there were no items designed to detect what knowledge and skills had not been intentionally instructed, such as those which children had actually acquired or the acquired children used on the spot in the study by Stevenson and Lee. Although Hatano pointed out that this missing piece of important information was collected by a series of assessments and interviews in the course of the second part of Stevenson and Lee's study, the coverage of items seemed not sensitive enough to identify what knowledge and operations children actually had and used. Without an examination of the effects of teaching, it appeared impossible to explain identified differences and to avoid the problem of over-generalisations and over-interpretations of causal factors. Thus, it was obvious that explanations provided for cultural differences and their effects on children's learning and competences were inclined to be partial. However carefully the research methodologies were carried out in these two studies, they necessitated certain conceptual categories which could illustrate and explain the differences in achievement. As Hatano pointed out, without delimiting these conceptual categories, there was no theoretical frame of reference to selections of explanations among factors or issues under scrutiny.

## 2.6 Summary

To respond to the question of *What shall the school teach?*, the field of human growth and development is the main basis for selection. Those concerned in the West intend to follow a child-centered ideal in early schooling by tailoring various learning programmes and structuring adaptive learning activities to match individual differences, however, impossible it may be in practice. The related disciplines provide generalisations and suggestions in terms of effects of children's

development on schooling. Although some studies indicate the necessity of physical and intellectual maturity and language acquisition, before structured programmes involving disciplined knowledge domains and skills can be taught, others suggest that interventions can be designed to elaborate and promote the development of existing abilities in the children. It is also suggested that children's interest should be taken into account and used as initial access to enjoyment and enlightenment of schooling. Age seems to be an economic concern for the administrator, rather than a sufficient condition for making a judgment on school readiness, because of its dependence on the context provided.

Children's performance, either superior or inferior, is a combination of children's established, existing and ever-developing qualities. They cannot take effect in isolation in a short specific time. In the sense that children's experience is continuously developing, and there is no such thing as completely new experiences, the research in the area should come to terms with all influences which may affect 'readiness for school'. The studies presented and discussed above adopt quantitative methodologies, such as questionnaires, closed interview schedules, and observations related to category systems. They tend to interpret correlated factors as causal ones and create, more significantly, a fallacy that the quantifiable parts can bring together a whole of inseparable and interactive components. It is also clear that it would be inappropriate to use instruments developed in western contexts to measure 'school readiness' or academic performance in Taiwan. Above all, this review of the literature indicates the necessity of adopting research methodologies and strategies which will facilitate, explore, illustrate, and explain the complexity and dynamics of the distinctively educational and social setting of the reception class in Taiwan. Thus, there is a need to review available research methodologies in education in terms of their sensitivity to the required information, in order to develop specific research strategies for the present study. The next chapter will focus on these methodologies in educational research. The conclusions of this review, together with a description of the pilot study (Chapter 4), will lead on to the research methods adopted in the main study (Chapter 5), and therefore to the findings (Chapters 6-9) and the conclusions (Chapter 10).

## CHAPTER 3

### Rationale for the General Methodology

Although starting school is one crucial phase of child development, in this study, school readiness is dealt with as a distinctively educational subject, rather than as a psychological one, in the sense that the meaning and significance of this special experience is restricted to the school environment. It is widely acknowledged that school education does not take place in a social vacuum. It is clearly recognised that, instead, school education occurs within contexts in which the identity of the prescribed student-role develops mainly through interactions between teachers and students, within the situational structures and provisions of the school. As far as the methodology and epistemology underlying the present study is concerned, it is vital to consider the relevance of the literature on the methodologies of the social sciences and educational research which lead into broad considerations of how data can be obtained which is sensitive and demonstrative enough to portray the problems associated with children entering school.

#### 3.1 Methodologies of research in the social sciences

It is well established that human beings strive to understand the world around themselves by all means. Enquiries about the natural and social world have been the mainstream of human history. Lincoln and Guba (1985) indicate that both the natural and the social sciences have undergone a series of *paradigm eras*, periods during which certain sets of prominent perspectives, assumptions and direct enquiries have been developed and implemented in different ways. In their view, there are three paradigm eras in relation to enquiries about the real world: prepositivist, positivist and post-positivist. Distinct theories and standpoints have been formulated along the never-ending path of attempts at understanding the world.

A paradigm is referred to as "a world view, a general perspective, a way of breaking down the complexity of the real world." Patton continues by claiming that

...paradigms are deeply embedded in the socialisation of adherents and practitioners. Paradigms tell them what is important, legitimate, and reasonable. Paradigms are also normative, telling the practitioner what to do without the necessity of long existential or epistemological

consideration. But it is this aspect of paradigms that constitutes both their strength and weakness - their strength in that it makes action possible and their weakness in that the very reason for action is hidden in the unquestioned assumptions of the paradigm. (1978, p.203)

Of the three paradigm eras, mentioned by Lincoln and Guba, the prepositivist is the longest and the least concerned with probing into the natural world, in comparison to the other two from a modern perspective. They consider that this is a period characteristic of a lack of active attempts at making sense of the natural world, which ranges over more than two millenia, from the time of Aristotle (384-322, B. C.) to that of David Hume (1711-1776). It is mainly because, as explained by Wolf (1981), Aristotle stands as a passive observer rather than active enquirer in the sense that he believed that what there was in physics happened naturally and that "attempts by humans to learn about nature were...unnatural, and so distorted what was learned." (p.22)

Aristotle believed in natural motion. Human's interference produced discontinuous and unnatural movements. And, to Aristotle, such movements were not God's way. For example, Aristotle envisioned the idea of "force." The heavy cart being drawn along the road by the horse is an unnatural movement. This is why the horse is struggling so. That is why the motion is so jerkily and uneven. The horse must exert a "force" to get the cart moving. The horse must continue to exert a "force" to keep the cart moving. As soon as the horse stops pulling, it stops exerting a "force" on the cart. Consequently, the cart comes to its natural place, which is at rest on the road. (p. 22)

In contrast, Mitroff and Kilmann (1978) point to two major well-known propositions by Aristotle, the *Law of Contradiction* (which indicates that no proposition can be simultaneously both true and false) and the *Law of the Excluded Middle* (which holds that every proposition must be either true or false). They argue that the application of these two propositions sufficiently provide passive observers with the complete range of scientific understanding.

Within the world of the mind, these thoughts occurred thousands of years ago. Scientists were passive then. It would take a while before they would attempt to reach out, to try ideas and see if they worked. (Wolf, 1981, p. 23)



As scientists began actively to strive to pursue real understandings and see if they worked, they became active enquirers, and at this point science is moving to the positivist period.

Positivism is "a family of philosophies characterised by extremely positive evaluation of science and scientific method." (Reese, 1980, p.45) The perspectives of positivism provide a new frame of reference to the undertaking of science that brought about a "literal paradigm resolution" (Lincoln & Guba, 1985, p.16), and yet there has been no clear agreement about what either the philosophy or the method involves. Habermas, elaborated by Hesse (1980), bears on the main ideas of Dilthey and outlines the critical axiomatic differences between hermeneutics and empiricism, leading to five counterpoints in opposition to five baselines of positivism which now are characteristics of the natural sciences - objectivity, hypothetico-deductive theory, external lawlike relations, exact and formal language, and separation of facts from meaning. Hesse demonstrates Habermas's positions in relation to the empirical sciences.

Paralleling the five points of the [Habermas's] dichotomy, we can summarise this post-empiricist account of natural science as follows:

1. In natural science data is not detachable from theory, for what count as data are determined in the light of some theoretical interpretation, and the facts themselves have to be reconstructed in the light of interpretation.
2. In natural science theories are not models externally compared to the nature in a hypothetico-deductive schema, they are the way the facts themselves are seen.
3. In natural science the lawlike relations asserted of experience are internal, because what we count as facts are constituted by what the theory says about their interrelations with one another.
4. The language of natural science is irreducibly metaphorical and inexact, and formalisable only at the cost of distinction of the historical dynamics of scientific development and of the imaginative constructions in terms of which nature is interpreted by science.

5. Meanings in natural science are determined by theory; they are understood by theoretical coherence rather than by correspondence with facts. (pp. 172-173, the parenthesis added)

Lincoln and Guba (1985) specifically outline what they see as five assumptions on which the positivist paradigm is based that appear to them increasingly hard to accept.

- An ontological assumption of a single and tangible reality "out there" that can be broken apart into pieces capable of being studied independently; the whole is simply the sum of the parts.
- An epistemological assumption about the possibility of separation of the observer from the observed-the knower from the known.
- An assumption of the temporal and contextual independence of observations, so that what is true at one time and place may, under appropriate circumstances (such as sampling), also be true at another time and place.
- An assumption of linear causality; there are no effects without causes and no causes without effects.
- An axiological assumption of value freedom, that is, that the methodology guarantees that the results of an inquiry are essentially free from the influence of any value system (bias). (p. 28)

Out of these positivist assumptions, the quantitative methodology of the social sciences has developed, and these extend the assumptions made. Hammersley and Atkinson (1983) argue that the logic of the natural sciences has been used to suggest that quantifiable variables can be controlled and measured to examine the relations among them. Secondly, the paradigm indicates that all variables can be explored and explained under a universal law that supposes that orderly relations among the variables exist across all circumstances. Thirdly, it excludes from consideration anything intangible and unobservable on the basis of "epistemological priority" of science.

Based on the premise outlined above, empirical-quantitative approaches and methods are intended to identify either causal relationships or correlations between

variables through means of pre-constructed category systems, artificial manipulations in experimental settings, and sophisticated statistical analyses. Deutscher (1966) has put forward a vehement line of criticism and rejection of the pre-determined measurement theory and his reason for this is

...that the adoption of the scientific model in the social sciences has resulted in an uncommon concern for methodological problems centering on issues of reliability and to a concomitant neglect of the problem of validity....We concentrate on consistency without much concern with what it is we are being consistent about or whether we are consistently right or wrong. As a consequence we may have been learning a great deal about how to pursue an incorrect course with a maximum of precision. (p.241)

Filstead also indicates that social scientists "have tended to blend, re-shape, and distort the empirical social world to fit the model they use to investigate it," wherever and however possible, "social reality is ignored." (1970, p.3)

Lincoln and Guba (1985) specifically outline the problems underlying positivism on which the quantitative approach is based. The first, the unsolvable problem of induction, results from the premise that the truth of propositions (facts on trial) cannot be decided except in relation to a true theory. The second, its operationalism which is at the heart of positivists' perspectives, is simply not meaningful or satisfying to most people's interest in understanding the real world. Operationalism is also too superficial, relying as it does, nearly entirely, on perceptions for its 'facts'. This means exclusions and a lack of commitment to deal with its meanings and implications. Its determinism overlooks free will and value systems of human beings and reductionism makes all phenomena related to human contacts and social reality ultimately surrender to a single set of so-called universal laws. The third, the research procedures based on the positivistic paradigm lead to the exclusion of the necessary humanness of the participants by refusing to give them equal rights of determination of the research. A great fallacy underlying this paradigm is that research is carried out with an outside (objective) perspective and this virtually undermines the importance and significance of an inside perspective (subjective). Above all, the positivistic paradigm brings about "an inadequate conceptualisation of what science is" (p. 25) and fails to deal with "emergent conceptual empirical formulations from a variety of fields." (p.27)

Post-positivism emerges in opposition to these failings but has pervasive influences on enquiry in the human world. Consequently, there are now strong voices among major disciplines of the social sciences opposing positivist ideals and practices. It has been suggested that the researchers must use methods that may act to enable more valid knowledge "through detailed and dense acquaintanceship" (Lofland, 1976, p.8) with social reality.

As far as psychological research is concerned,

The marriage between psychology and natural science brought a crucial attitude to the study of psychological phenomena, and this was an important step forward. But the attempt to transfer other features of the natural sciences also had negative effects. Principally, this alliance: 1) deflected psychology away from its primary subject matter - thinking, feeling, and willing; and 2) perpetuated an unwillingness to recognise the special quality of psychological phenomena [he calls] *reflexivity*. (Bakan, 1972, p.87-88, the parenthesis)

In respect to sociology, Pope (1982) comments that research in the area was in so-called "pragmatic crisis" in the early 1920s from which the interpretive sociologies emerged.

For many disillusioned by the failure of the quantitative empirical paradigm to generate knowledge of the social world, the study of member accounts promised to reveal the reality and richness of a world that social scientists succeeded in misrepresenting.

In their methodological orientation, the new interpretive sociologies stood opposed to the tenets of the old positivism. None of the symbolic interactionists and ethnomethodologists believe that social sciences should aim to produce law-like sets of propositions, believing instead that social science should provide a deeper understanding of individuals, their perceptions, and the meanings they attach to social life. Hypothesis formation, operationalisation, and testing are rarely seen as stages in a research program- they are simply processes that occur when the sociologist is in the field....For ethnomethodologists, any search to objectify their accounts in order to present the candid "truth" about the social world is fruitless- social scientific productions are not objective in the sense of being free from contexts, since they are grounded in the sociologist's everyday practices and constructs. (Reynolds, 1980/1981, p. 81)

Schutz (1967) argues that reality is too difficult to be explained until its meaning set and held by those involved in everyday life can be found. This perspective, the theme of interpretive sociology, attempts to

...study social behaviour by interpreting its subjective meaning as found in the interactions of individuals. The aim, then, is to interpret the actions of individuals in the social world and the ways in which individuals give meaning to social phenomena. (p. 11)

Stake (1977) also puts forward interesting arguments.

There is too great a temptation to suppose that truth is to be found in words and to suppose that intuitions are only poor facsimiles of truth. In practical matters, what is in fact true is that which is understood....In any circumstance the truth might be but a single truth - but evaluators are certain not to find it. What they can find are multiple truths, multiple understandings, some contradictory to others. Evaluators should seek to resolve the contradictions and misunderstanding but should expect that they will have to portray the multiple realities they find. (p.19)

Lincoln and Guba (1985) term this alternative paradigm as the naturalistic paradigm. Naturalism is "the philosophical view that remains true to the nature of the phenomenon under study." (Matza, 1964, p.5) Hammersley and Atkinson (1983) indicate that naturalism is based on a range of philosophical and sociological perspectives: symbolic interactionism, phenomenology, hermeneutics, linguistic philosophy, and ethnomethodology. Central to the epistemology and methodology drawn from naturalism is "an understanding of the view of the world held by those people involved in a situation rather than adopting a stranger's perspective or ascribing structural function to external aspects (stimuli) of the environment." (Pope, 1982, p.3)

Lincoln and Guba (1985) summarise the following assumptions of naturalism.

There are multiple constructed realities that can be studied only historically; inquiry into these multiple realities will inevitably diverge (each inquiry raises more questions than it answers) so that prediction and control are unlikely outcomes although some level of understanding (verstehen) can be achieved...

The inquiry and the 'object' of inquiry interact to influence one another; the knower and known are inseparable...

The aim of inquiry is to develop an idiographic body of knowledge in the form of a 'working hypothesis' that describes the individual case...

All entities are in a state of mutual simultaneous shaping so that it is impossible to distinguish causes from effects...

An inquiry is value-bound at least in five ways...(1) ...the inquirer's values as expressed in the choice of a problem, evaluand or policy option, and in the framing, bounding, and focusing of that problem, evaluand or policy option... (2)... the choice of the paradigm that guides the investigation into the problem... (3) the substantive theory utilized to guide the collection and analysis of data and in the interpretation of findings; (4) the values that are inherent in the context... and (5) the extent to which the problem, evaluand, policy option, paradigm, theory and context exhibit convergence (value resonance) which ensure meaningful results. (pp. 37-38)

The differences in axioms between positivism and naturalism, outlined by Lincoln and Guba (1985, p.37), provide a frame of reference for methodologies sensitive, appropriate, and relevant to educational research.

<b>Axioms about</b>	<b>Positivist Paradigm</b>	<b>Naturalist Paradigm</b>
The nature of reality	Reality is single, tangible, and fragmentable.	Realities are multiple, constructed, and holistic.
The relationship of knower to the known	knower and known are 'independent', a dualism.	knower and known are interactive, inseparable.
The possibility of generalization	Time- and context-free generalisations (nomothetic statements) are possible.	Only time- and context-bound working hypotheses (idiographic statements) are possible.
The possibility of causal linkages	There are real causes, temporally precedent to or simultaneous with their effects.	All entities are in a state of natural simultaneous shaping, so that impossible to distinguish causes from effects.
The role of values	Inquiry is value-free.	Inquiry is value-bound.

*Table 3.1 Contrasting Positivist and Naturalist Axioms (p.37)*

## 3.2 Qualitative methodologies and strategies

### 3.2.1 Methodological discussions

It is argued that there are two main paradigms employed in educational research.

The one is modelled on the natural sciences with an emphasis on empirical quantifiable observations which lend themselves to analyses by means of mathematical tools. The task of research is to establish causal relationships, to explain (Erklären). The other paradigm is derived from the humanities with an emphasis on holistic and qualitative information and interpretive approaches (Verstehen). (Husen, 1985, p.4336)

Although educational research which adopts pre-established constructs may be reasonable to use, where the variable is known to be little affected by context, as in the case with many psychological traits, such an approach obviously can hardly be defended or justified whenever broad aspects of education are being investigated. Education is characterised by 'context-dependency of phenomena' on which the investigation and analyses are drawn (Svensson, 1985). Methodologically speaking, predefined and limited conceptual constructions derived from a developed theory have the tendency to reduce facts and meanings inherent in distinctively context-bound phenomena to a narrow band of hypothetical categories. Quantifiable results derived from such methods obviously cannot adequately describe the everyday social situation (Glaser & Strauss, 1967; Svensson, 1985). Epistemologically speaking, the quantitative paradigm of quantification, hypothesis-testing and generalisation implies reductionism, determinism, mechanism, and atomism, inevitably reducing the complexity, diversity, dynamics, and subjectivity of the participants, social processes, and contexts which exist in the real world. Quantitative methods, such as experiments, structured interviews, and survey research, may thus fail to come to terms with what is distinctive within the educational development and process (Neumann, 1987). Scientific research in education, essentially based on statistical manipulations and instruments for exploring educational phenomena, would leave "...largely untouched some areas of major concern to education." (Dunkel, 1979, p. 80) De Landsheere (1985) also emphasises that

It is now fully realised that the rigid scientific ideal, embodied in the neopositivist approach, cannot take into account the multifaceted

aspects of human behaviour and all its environment-bound subtle nuances. (p. 1589)

The qualitative paradigm has emerged as an alternative to the widespread dominance and assumed legitimacy of the quantitative approach in the social sciences (Hammersley & Atkinson, 1983; Atkinson et al., 1988). The interpretive-qualitative approach represents an attempt to pursue direct explorations and empathetic understandings of processes and contexts within the social world from the perspectives of participants (Hammersley & Atkinson, 1983; Atkinson et al., 1988). In the sense that the participant is regarded as both the subject and object of understanding the world, the qualitative approach represents humanism and romanticism in nature. As far as educational research is concerned, both Dunkel (1972) and Gowin (1972, 1973) have demonstrated the shortcomings of the science ideal as applied to research on educational phenomena. They both attack what they see as a prevailing fallacy, that educational research can draw on the doctrinaire tenets of science in a narrow orientation in establishing 'scientific facts'. They go on to suggest that educational research should begin with the new paradigms and perspectives amenable to distinctively educational phenomena.

Insight from naturalistic enquiries into education is aimed at exploring "the things in themselves", i.e. "empathetic understandings" of educational phenomena (Tesch, 1984, p.5). Although varying perspectives, methods and strategies are formulated in different approaches within the qualitative paradigm, such as educational ethnography, participant observation, unstructured interview, subjective accounts, and life histories, there are also common principles that underlie implementation of field studies and the collection of interpretive data. Central to phenomenological methodologies is that participants are the experts in deciding the aspects the researcher should be interested in (Tesch, 1984).

It is a truism that schools and classrooms are socially structured settings and the activity of teaching and learning involves social process and reality. Perspectives of naturalism provide a growing recognition of the relevance and importance of qualitative methodologies in describing educational practice.

The approach, based upon a view of man as an active participant in the creation and construction of social reality, emphasises an investigation of the process by which those involved in the educational enterprise construct, define and manage their everyday world. The nature of school



knowledge, the organisation of the school, the ideologies of teachers, indeed *any* educational issue, all become relative - and the central task for the sociology of education becomes to reveal what constitutes reality for the participants in a given situation, to explain how these participants come to view reality in this way and to determine what are the social consequences of their interactions. (Barton and Walker, 1978, p. 274)

Truth then emerges not as one objective view but rather as the composite picture of how people think about the institution and each other. (Bogdan and Taylor, 1975, p. 11)

Lincoln and Guba (1985) indicate that a study carrying out research in the mode of the naturalistic paradigm should draw on more than the five axioms outlined above as guides. They suggest 14 important implications of the paradigm for implementing research. Namely, it is suggested to hold on to (1) logical dependence upon the axioms; (2) the human being as instruments; (3) utilisation of tacit knowledge; (4) qualitative methods; (5) purposive sampling; (6) inductive data analysis; (7) grounded theory; (8) emergent design; (9) negotiated outcomes; (10) case study reporting mode; (11) idiographic interpretation; (12) tentative application; (13) focus-determined boundaries, and (14) special criteria for validity. Their positions, which a naturalist researcher is suggested to follow, are convergent on six aspects. First, the researcher has to get into the natural setting because he cannot specifically define what is important to investigate and even to control without a priori theory or hypothesis. Until the researcher has spent long enough in the setting he cannot decide the focus in more than basic forms or establish boundaries for it. Second, the researcher cannot develop a contrived study, because he does not know what to contrive. Thus, data must be grounded and analysed inductively. Third, the researcher must use the human being as an "open-ended adaptive instrument", who can discover and relate its way to the focal point without having been clearly predetermined to "strike" it. Humans, according to Lincoln and Guba, are inclined to use qualitative methods that expand human sense: seeing, hearing and tacit sensitivity that leads one to carry out interviews, observations, documentary analysis and so forth. Fourth, idiographic interpretations, rather than aggregations, generalisations, or causal-effect statements, are ensured and consolidated with knowledgeable respondents. Only through these interpretive processes and results can tentative proposals for application be reasonable. Finally, the case study mode provides a special

opportunity to give full descriptions that very likely portray all possible aspects and enhance the reader's understanding. The justification for the naturalist researcher to develop a research design following the above 14 guidelines is to ensure demonstrable coherence and interdependence of each suggested actual operation.

Qualitative research in education began in Britain in the late 1960s and early 1970s (Bodgan & Biklen, 1982; Neumann, 1987; Atkinson et al., 1988). Among the considerable number of new scholars in the field, there was a reaction against the theoretical and methodological underpinnings that had previously dominated, such as psychometrics, systematic observation, survey research, and structural functionalism (Atkinson et al., 1988). The new methods derived from other traditions within social and cultural anthropology, sociology (symbolic interactionism), and phenomenological psychology (Bodgan & Baklein, 1983; Atkinson et al., 1988). There appears to have been a distinct development, in that, the new approaches to educational research have rectified the previous distortions of educational investigations created by over-reliance on an inappropriate research paradigm and has allowed a new generation of researchers to explore what takes place in school settings in the natural state, from the point of view of the participants. More importantly, in practice,

Qualitative methodologies allow the researcher to "get close to the data", thereby developing the analytical, conceptual, and categorical components of explanation from the data itself - rather than from the preconceived, rigidly structured, and highly quantified techniques that pigeonhole the empirical social world into the operational definitions that researcher has constructed. (Filstead, 1970, p.6)

### 3.2.2 Qualitative strategies

Recently, triangulation has arisen as an important strategy for naturalistic enquiry and qualitative research. This is a strategy by which various data sources and methods are brought to bear on to a singular phenomenon studied. Mathison (1988) outlines two assumptions which underlie triangulation. The first is that the elimination of the bias involved in any particular data source, investigator, or particular method can be done by using it in conjunction with other data sources, investigators and methods. The second is that a better understanding of any social phenomena can be achieved by corroborative and complementary interpretations of an issue under study.

Denzin (1978) categorises four types of triangulation: (1) data triangulation including time, space and person, (2) investigation triangulation, (3) theory triangulation and (4) methodological triangulation. Of them, plausibility of theory triangulation is held in greatest doubt, while methodological triangulation is the most common and refers to the use of multiple methods in the investigation of a social phenomenon (Mathison, 1988). Denzin also indicates that, instead of within-methods triangulation which leads to limited value, between-methods triangulation is more satisfactory. He explains that "the rationale for this strategy is that the flaws of one method are often the strengths of another: and by combing methods, observers can achieve the best of each while overcoming their unique deficiencies." (p. 302)

Typically, triangulation is used to improve the credibility of research findings and the trustworthiness of interpretations by eliminating bias and dismissing plausibly contradictory explanations (Mathison, 1988). As Miles and Huberman (1984) argue, "...triangulation is supposed to support a finding by showing that independent measures of it agree with it or, at least, don't contradict it." (p. 235) More importantly, triangulation gains ground because of a full recognition of the fact that no single data source and method should ever be given paramount value when different methods possess specially different strength and weakness. Patton (1980) argues that triangulation is to "study and understand when and why there are differences." (p. 331) Smith and Kleine (1986) point out that the use of multiple methods as triangulation lead to firmer understanding, thus enhancing the credibility of results. Morine-Dershimer (1985) also indicate that triangulation of varying sources of data on the same phenomenon can be used to test, corroborate and elaborate each other to enhance the validations of interpretations and conclusions. In contrast, Mathison (1988) suggests that

Practicing researchers and evaluators know that the image of data converging upon a single proposition about a social phenomena is a phantom image...More realistically we end up with data that occasionally converge, but frequently are inconsistent and even contradictory. And we do not throw our hands up in despair because we cannot say anything about the phenomenon we have been studying. Rather, we attempt to make sense of what we find and that often requires embedding the empirical data at hand with a holistic understanding of the specific situation and general background knowledge about this class of social phenomena. This conception shifts the focus on triangulation away from a technological solution for ensuring validity and places the responsibility with the researcher for

the construction of plausible explanations about the phenomena being studied. (p. 17)

Webb et al. (1966) suggest that although triangulation of methods may be difficult, it is very much worth doing because it makes data credible.

As far as descriptive and interpretive data are concerned, it is stressed that a combination of research methods serve not only to enrich and elaborate empirical evidence through varying sources of data, but also to enhance the validity of the results (Neumann, 1987). Of the varying qualitative approaches and strategies, some are more pertinent to the fieldwork used in the main study, such as comparative analysis (Glaser & Strauss, 1967), phenomenography (Marton, 1981, 1986) and contextual analysis (Svensson, 1985). As far as the relevance of these research approaches and the field study are concerned, delimited categorisations and comparisons are particularly useful in considering the proposed strategies, procedures, and analyses to be adopted in this study.

Generally speaking, the theorists presented above all stress the importance and significance of continuously-delimited conceptual categories, and see categorisations as representative forms which signify and illustrate the nature and meaning of the investigated situations. Glaser and Strauss (1967) claim that conceptual categories serve not only to elaborate the concept, but also to bring about "relevant theoretical abstractions" (p.23). Categorisations in the phenomenographical studies represent and demonstrate the relations between theory and empirical evidence, whereas they describe "the context-dependent meanings of the concept" in the research approach described as context-analysis (Svensson, 1985).

Based on the premise of delimiting variables in the form of categories, systematic comparisons are seen as a distinctively appropriate means of elaborating categories, and the relations among those categories (Glaser & Strauss, 1967, Lincoln & Guba, 1985, Svensson, 1985). Comparisons in the phenomenographic studies are essentially made in terms of similarities and differences in the 'content' of what is conceptualised. They are arrived at by means of grouping the common nature and differentiating characteristic qualities of the specific data representing the properties of the case and phenomena in the context-analysis approach (Svensson, 1985).

In contrast, Glaser and Strauss (1967) argue that comparisons are made by comparing various, similar forms of empirical evidence representing the same conceptual categories and properties. They suggest that comparisons begin by minimising differences in the 'comparative groups' to generate the prime categories and their properties, followed by a maximising of variants within the 'comparison group'. It is also claimed that constantly and systematically comparing groups of individuals will provide all that is necessary for the discovery of a grounded theory. In spite of the differences in the strategies, the subjects, and the units of comparisons, the delimiting of both categories and of the relations among categories is generally regarded as the most appropriate approach in progressively developing comparisons.

It is argued that categorisations, comparisons, and delimitations of the investigated categories are closely related to each other, and the delimited relations among the categories serve to illustrate the nature of the case under study:

The basis for interindividual categorisations is a common language for descriptions of specific data. The categorisations represent groupings of individuals (instances) and must thus be arrived at by means of comparisons between individuals (instances).

The categories searched for are categories having different and meaningful relations to other relevant categorisations. However, such patterns are dependent on significant categorisations of specific data. Due to the interdependence between delimiting categorisations and patterns, the analysis has to be an iterative process of comparisons of interpretations of specific data and patterns of specific data between instances (individuals) leading to categorisations and meaningful patterns of categories. (Svensson, 1985, pp. 6-7)

Categorising instances, as Spradley (1979) argues, is a matter of dealing with "units" of information which, sooner or later, act as the basis for generating categories. Lincoln and Guba (1985) point out two characteristics which entail units. One is that they "should be heuristic", that is, they are "aimed at some understanding or some actions that the inquirer needs to have or to take." (p. 345) The other is that they "must be the smallest piece of information about something that can stand by itself", that is, they "must be interpretable in the absence of any additional information other than a broad understanding of the context in which the inquiry is carried out." (p. 345)

In processing data emerging from the present study, two major tasks are particularly relevant, i.e. unitisation and categorisation. Unitisation encompasses two steps (see Glaser & Strauss, 1967; Grove, 1988; Lincoln and Guba, 1985). The first is to place the smallest pieces of meaningful information-units, on index cards; sentences and paragraphs are written as examples of selected information. The second is to code a complete set of cards for the sources from which each unit is taken. Namely, the practice is concerned with the kind of information from which each unit is drawn and the episode during which each unit is collected. Categorisation involves five steps. First, to put cards in unnamed categories in terms of the researcher's intuitive knowledge and professional judgments. Second, to define the properties and their meanings subsumed under each category that are up to crucial size and then bring these together with provisional rules for inclusion. After approximately fifty or sixty cards have been placed under established categories, new categories then emerge slowly. Third, to give categories names in terms of the frame of reference based on literature suggestions. Fourth, to carry on the process of sorting out categories in terms of provisional rules of unnamed categories. Fifth, to review categories in order to identify the plausible relationships among emergent categories, namely examining the possibility that some categories may be subsumed by others while some may be logically irrelevant or incomplete in themselves which should be left out.

Data collected in the field must be, according to Lincoln and Guba (1985), analysed inductively from raw and specific data to subsuming categories of information since real empathetic understanding is grounded in the field data. This means, in their words, trying to "define local working hypotheses or questions that can be followed." (p.336) Inductive analysis suggested in constant comparative methodologies is carried out as a process for "making sense" of field data (Grove, 1988).

It is obvious that the qualitative paradigm and practical strategies have gained firm ground in terms of epistemological and methodological justifications. However, having justified their appropriateness and relevance, it is vital to reflect on criticisms of qualitative methodologies and then to have practical suggestions about establishing and ensuring the validity of designing, implementing and analysing fieldwork in order to guarantee the quality of the qualitative research.

### 3.3 Approach to establishing validity

We have described the contrasting differences between empirical-quantitative and interpretive-qualitative approaches, based on the priorities of epistemology, methodology, and constructions of empirical studies. Two paradigms and underlying methods serve special purposes as a consequence of their possessing unique strengths and inevitable weaknesses. Although the qualitative paradigm is suggested and recognised as the appropriate way to make a direct exploration and achieve empathetic understanding of social contexts and process, criticisms have been made by the proponents of the quantitative approach on the basis of its inability to produce "scientifically reproducible fact" and its insensitivity in identifying the significant and crucial aspects embodied in the numerous and ubiquitous events and phenomena studied (Glaser & Strauss, 1967) Biddle (1967) sees participant observations of educational ethnography as "a very simple method" and defines it as "the broadest and simplest methodology used in classroom studies;" (p.338) That 'simplicity' is, however, only on the surface, as the analysis of qualitative data is formidably complex.

As discussed previously, qualitative methodologies and strategies are aimed at naturalistic enquiries in line with a key point that it is impossible to understand people and the meaning of their actions unless they are taken in the whole context. They do not involve interventionism, rather they entail empathetic explorations and understanding of particular and bounded social participants, settings, processes and phenomena in their natural state. Locke (1986) argues that the differences between quantitative and qualitative research exist in the the methods used at the tactical level and the assumptions held by the researcher at a strategic level. Qualitative research is interpretive in the sense that the main concern is with developing an understanding which is more comprehensible and explicit. Locke outlines nine critical questions about the validity of data obtained through qualitative methodologies and strategies: (1) generalizability related to external validity, (2) truth concerned with internal validity, (3) objectivity related to the researcher's bias, (4) reliability concerned with public verification of data, (5) reliability of analysis related to the replicability of process in drawing conclusion from data, (6) reactivity concerned with possible contamination resulting from the researcher's presence, (7) subject falsification related to the effect of social desirability on the quality of data, (8) triviality concerned with the commonplace

and finding what everybody already knows, and (9) ethics concerned with intrusion, protection of participants and deception.

To enhance credibility of qualitative research in the fashion of naturalistic enquiry, Lincoln and Guba (1985) suggest five tasks be undertaken: (1) activities which increase the probability that credible findings will be produced, such as prolonged engagement, persistent observations, and triangulation; (2) peer debriefing which leads into revelations of self-delusion and bias; (3) negative case analysis which enables the research to avoid foreseeable or taken-for-granted problems; (4) establishing the adequacy of critiques written for appraisal purposes "under the connoisseurship model" and (5) checking the authenticity of processing information with members of participants from whom raw data are collected. Locke (1986) specifically makes suggestions for avoiding subject falsification: (1) being aware of risk and constantly keeping oneself reflective; (2) keeping in mind that most dissembling is caused by perceived threat; (3) bearing in mind that faking is hard to maintain over time; and (4) holding on to procedures for cross-examining various data sources.

The criticism of the qualitative approach of failing to reach general conclusions seems to ignore the variations and subjectivities of social reality that simply cannot be removed by imposing the methodologies of the natural sciences on them. It appears unjustified to criticise the characteristic nature of the qualitative approach in terms of doctrinaire tenets of the quantitative approach. There is no doubt that a plurality of methods, through well-recognised research procedures, can enhance the credibility of interpretive-qualitative information. Also, constant reflection enables the researcher to eliminate the effects of the subjectivity of the individual researchers and their familiarity with social context of the field itself, on the field study as a whole (Hammersley & Atkinson, 1983).

Above all, the researcher plays a pivotal role in the quality of the study modelled on either quantitative or qualitative approaches. As early as 1935, Fisher's suggestions for multivariate analysis contain illuminating insights into the relations of the researcher to empirical research in general.

We are usually ignorant which, out of innumerable possible factors, may prove ultimately to be the most important, though we may have strong presuppositions that some few of them are particularly worthy of study. We have usually no knowledge that any one factor will exert its effects



independently of all others that can be varied, or that its effects are particularly simply related to variations in these other factors...If investigators confined their attention to any single factor, it might be inferred either that they were the unfortunate victims of a doctrinaire theory as to how the experimentation should proceed, or that the time, material, or equipment at their disposal was too limited to allow attention to be given to more than one narrow aspect of the problem.(Fisher, 1935, quoted in Marjoribanks, 1985, p. 2622)

And that comment can be applied equally well to the problems of describing the situation in reception classes in Taiwan, which is the main focus of this thesis, and to which we now return by reporting a pilot study which explored various ways of collecting data within this particular social setting.

## **CHAPTER 4**

### **The Pilot Study**

In this chapter, the procedures, the results and the implications of the pilot study are reported along the three main aims of the work. Firstly, to identify the aspects on which children's learning experience was built. Secondly, to pilot the qualitative methodologies proposed for carrying out the main study, and at the same time to gain experience in, and refine, appropriate techniques of data collection. And, finally, to draw from the preliminary analyses of the data suggestions about a research design for the main study.

#### **4.1 Procedures**

This section outlines the sample, the focus and the methods, and the phases of undertaking fieldwork prior to entry into the classrooms.

##### **4.1.1 The samples**

For the convenience of transportation and to provide an adequate sample for the pilot work, the sample of primary schools were drawn from four administrative districts of Taipei, the capital of Taiwan - the southern, northern, eastern and western districts. To explore the effects of school catchment areas, it was planned that eight reception classes were randomly selected from urban and suburban areas of these four administrative districts.

However, this systematic selection of schools proved impossible to achieve, as teachers would not give their consent to the carrying out of the study. They gave two main reasons for their refusal. One was that the researcher, being a strange adult in classrooms, would confuse and distract the entrants from concentrating on the teachers with whom they ought to know and familiarise themselves as soon as possible. The other was that the reception teachers were occupied with the entrants so much that they could not afford any extra time, effort, and responsibility for the research project. It was stressed that the relationship between the teachers and entrants ought to be formally and firmly established quickly or the reception classes would be chaotic thereafter. Under such circumstances, as the teachers insisted, nothing the researcher observed could represent reception education in practice and

could provide practical insight into the present study. Since there is no written regulation that the school and teachers are obliged to take part in research projects in Taiwan, it was not surprising that teachers refused to join the pilot study. The alternative, which was adopted for the pilot study, was to identify schools already known to the researcher where the attitudes of the teachers were more favourable to research. The warnings about the possible effects of the researcher were discussed with the teachers to be included in the sample. It was felt that the other teachers were being unnecessarily defensive, and that the potentially disruptive effects could readily be avoided with sensitivity and care from the researcher in that situation.

Table 4.1 summarises the background information about the sample of the classes and the teachers along six categories: educational background (Edu.), teaching experiences in total (T.E.), teaching experiences in Primary 1 (Pl.T.E.), administrative districts (Admin.D.), the number of pupils in the class (P.N.) and the number of Primary 1 classes in the school (Pl.N.).

Teacher	Edu.	T.E.	Pl.T.E.	Admin. D.	P.N.	Pl.N.
K	diploma	2	1	northern suburban	43	6
J	diploma	3	2	eastern suburban	46	4
W	B.A.	7	4	western urban	55	14
E	diploma	9	6	eastern urban	49	16
N	diploma	13	9	western suburban	48	10
V	diploma	15	7	southern urban	56	18
A	B.A.	16	11	northern urban	54	19
Q	diploma	27	15	southern suburban	47	9

*Table 4.1 An outline of background on the sample of the teachers (Eight alphabets represent the initial letters of the teachers' names)*

#### 4.1.2 The focus and methods

The pilot study was mainly aimed at exploring the aspects which affected children's learning experiences acquired before starting school. In attempting to stress the effects of school demands on the children's difficulties in starting school and making progress, the reality of reception classes was also under scrutiny. Since the

pilot study was mainly undertaken to identify the important issues on which the main study should focus, it was the commonality of the related aspects which the fieldwork sought.

Interviewing the teachers was the major method employed in the pilot study. Although interviewing was proposed as an open-ended and interviewee-centered exchange, the semi-structured interview schedules were particularly directed towards the areas and the ways in which children's learning experience was acquired. To eliminate the teachers' anxiety and establish rapport, the interview schedule was revealed to them beforehand. As explained to the teachers, interviewing was essentially concerned with (1) the crucial aspects related to children's learning experiences developed in distinct settings before starting school; (2) the relationship between children's previous experience and school demands; and (3) children's responses to the immediate context of reception classes.

Although the children were not invited to take part in the pilot study, some were interviewed as the opportunity arose. Interviewing the children under such circumstances was aimed at working out how feasible it would be to collect data from the children in the main study. The specific purposes of this attempt were fourfold. First, to gain practical insight into the best way to establish rapport with young children in a research context. Second, to acquire direct and sufficient experience and understanding of the procedures of developing and employing the research strategies and the human relation skills appropriate for collecting data from young children. More importantly, these particular techniques were employed not only to make children feel secure and free to reply to the questions, but also prevent them from making points aimlessly. Third, to gain empathetic understanding of characteristics of children's language competency and interpretive orientations. Fourth, to gain practical insight into analyses and interpretations of information obtained directly from children.

It was also possible to have brief conversations with a few of the children's parents who visited the teachers throughout the field studies. Some parents occasionally, and others regularly visited school. However, most of the parents paid intensive and frequent visits to school in the initial weeks. In fact, there were only two out of eight sampled schools which allowed the parents to meet their children inside the school: in the others they had to wait outside. Due to the constraints of rigidly-

regulated timetables, it was difficult for the researcher to talk to the parents about their children's development generally and their strengths and weaknesses in particular.

Basically, the observations served to identify the immediate contextual aspects related to the learning experiences of the children. The findings attempted to explain the children's difficulties in engaging in the lesson activity and in responding to the learning tasks from the perspective of the demands made by the teachers. The guideline of observations was specifically on the instances and the events closely related to children's learning in the reception class. In response to the teachers' apprehensive reactions to the idea of tape-recorded situations, note-taking was the method of collecting data of interviewing and observations.

#### 4.1.3 The procedures

All eight school principals or headteachers were very concerned about the unfavourable effects of the researcher's attendance in the classes on the teachers' work and the children's concentration at very beginning. Thus, they suggested that the pilot study start in the classrooms from the third or fourth week of school. It was agreed, therefore, that each teacher would be interviewed and observed in a school day from the third week of school. However, after this general survey undertaken in eight classrooms over two weeks, only Mrs A who taught in the school in the northern urban area and Mrs Q who worked in the school in the southern suburban area were willing to continue to take their part in the intensive observations and post-lesson interviews on two alternate full days respectively. The second phase of work was mainly dedicated to full-day intensive observations across varied kinds of subject areas as scheduled on the syllabuses in two classes. The fieldwork was due on Monday and Thursday in Mrs A's class, and on Wednesday and Saturday in Mrs Q's. In the meantime, post-lesson interviews were employed to gain the teachers' explanations about the demands made and the children's difficulties. The other six teachers were observed and interviewed alternately on Tuesday and Friday. Two months of the pilot study set up the guidelines for the main study which was carried out in the following year.

## 4.2 The findings

Overall, the pilot study served as a prelude to the main study. It was an entirely open approach which attempted to identify issues considered important, and worthy of examination, in the main study. From the substantial volume of raw data derived from interviews and field notes of classroom observations, it was possible to identify certain themes and issues. There were two main themes running through the results of the pilot study. One was the difference in children's learning experiences acquired in different learning settings before starting school and their relationships with school demands. The other was the features which dominated the children's experience in the immediate context in which the children confronted the learning tasks in the classroom. What follows is a summary of what Taiwanese teachers believed to be important in affecting the subsequent progress of entrants into reception classes, and conclusions reached from observing the teaching and learning in those classes.

### 4.2.1 Factors related to learning experiences between home, kindergarten and school

With special reference to Taiwan, the teachers all recognised that reception education was of particular importance as the departure point from which children started formal schooling generally and academic learning in particular. It was recognised that the family was the first unit in which the children were culturally socialised for the most part. The kindergarten was thought to aid in the transition between home and school which allowed children to be prepared for the more sophisticated patterns of human relations, and the controlled package of institutionalised knowledge and skills, in school. Five areas were identified as being the decisive aspects which enabled the children to become able learners and workers, namely, the role of knowledgeable and mature adults, the learning programmes, the structure of the learning activity, the requirement for performance and the evaluation of learning outcomes. These will be explained in turn.

#### *The role of mature and knowledgeable adults*

The role of the parents was recognised as being particularly important. The parents were described as nourishing the children's development generally. From the point

of view of the teachers, the parents in the urban areas (which, in Taiwan, contain the higher social class) were more likely to be intellectually knowledgeable and psychologically supportive, whereas those in suburban areas (mainly working class) were likely to have only incidental knowledge and to support the children only in material ways. There was agreement among the teachers on the relationship between the role of the parents, family background, and the children's learning experience. The parents in urban areas by and large were well-educated and professional and had more time, more relevant information, and more financial resources available, for providing their children with both a stimulating learning environment at home and private tuition outside. The parents in suburban areas were generally non-skilled labourers who worked part-time or full-time for long periods, were largely ignorant of early childhood education, and above all, were short of financial resources. It was thought to be inevitable that the children in these areas would have very superficial and scant interactions with their parents who worked long hours. At worst, as the teachers stressed, this kind of life-style put the children at a great disadvantage in human relations, experiential knowledge, literacy and basic skills. They pointed out that, although parents who worked long hours gave their children a certain amount of money to buy their meals and things needed in school such as pencils, papers, notebooks, rubbers and so forth, most of the children in fact used up this money doing things which were intellectually and practically irrelevant, inappropriate and unfavourable, such as playing video games and buying sweets and poor quality cartoon books and toys. For teacher N, who worked in a primary school in the western suburban area, the key to the disadvantage facing these children was lack of good models of knowledge and discipline which they could follow and imitate. She explained that the children in suburban areas had not been intellectually and culturally socialised well enough to be comfortable with group life generally, and academic matters in particular, when starting school.

Highly-educated parents in urban areas were generally described as child-centered supporters, in the sense that they believed that their children should be respected as individuals and be put first. It was pointed out that this kind of parent tended to give the children full support in their attempts to learn and do things, to provide them with sufficiently stimulating materials, and to talk to them whenever opportunities arose. But the teachers stressed that child-centered ideals and practices held by the parents had both advantages and disadvantages. As far as the

children's learning experiences were concerned, these parents used all the resources and facilities available to enhance the children's literacy, common sense, general knowledge, and basic skills. However, for the teachers, these children were unintentionally spoilt and eventually were inclined to refuse to do things against their will, take things for granted, do things in their own terms, work hard on only things interesting to them or involving their own concerns or purposes.

The teachers all stressed that kindergarten education began to play a very important role after the third birthday of the children, the age of going to pre-school. It was revealed that more than 99 % of school-age children living in Taipei had been in kindergartens in the years before starting school. Although the teachers confirmed that they did not have direct contact with kindergartens, they all felt very strongly about the role played by kindergarten teachers in the children's subsequent development. Kindergarten teachers were expected to be a combination of caring parents who provided psychological support and verbal stimulations, and professional teachers who imparted accurately what school valued and supported to the children in comprehensible ways. It was explained that, in practice, most kindergarten teachers tended to be too caring, pleasant, and compromising in front of the children to achieve the expected goals. The teachers all pointed out that both kindergarten teachers and reception teachers were authority figures in one way or another, but the practical role played by kindergarten teachers left the children more freedom, alternatives, negotiation, help, and attention, throughout the interaction. Under such circumstances, as the teachers stressed, the children were not intellectually, linguistically, psychologically, emotionally, and behaviourally socialised as they should be. It was said that kindergarten teachers distorted the process and results of the children's necessary socialisation into knowledge acquisition and human relations by surrendering so much to satisfy the children's immediate interests.

There was a consensus among the teachers that for the children, the school teacher was primarily an authority figure who knew everything accurately, got everything right, and did it perfectly. The children were said to be afraid to approach solemn, uncompromising, and demanding school teachers. By being solemn, it was meant that the school teachers were very serious about everything they did and hardly smiled at the children. By being uncompromising, it was meant that the school teacher did not negotiate with the children, left neither freedom nor choice to the



children, and stood by everything they said and planned. By being demanding, it was meant that the school teachers required, rather than helped, the children to respond to school situations all the time. It was pointed out that these aspects of the perceived role of the school teacher led to three distinctive phenomena. First, the children did not interact with the teachers freely and intimately as they did with their parents and kindergarten teachers: this made some children feel insecure and hopeless. Second, they could not have individual-based attention and immediate help whenever they needed, specific and detailed explanations of whatever was difficult or unfamiliar to them, and mutual and intimate communication, however desperately the children wanted it. The teachers stressed that the children had to get down to the learning tasks and cope with difficulties on their own. Third, the children had to follow what the teachers said and required. The children's learning experiences were inevitably attempts to follow exactly the teacher's book-based explanations and actual operations. The shift of the role of knowledgeable and mature adults from the parents and kindergarten teachers to school teachers was thought to impose severe demands upon the children for obedience, self-reliance, responsibility, independence, and commitment to school performance.

#### *The learning programmes*

Three main domains of the children's learning experiences were identified by all the teachers as relevant to the learning outcomes in reception classes, namely, literacy, numeracy, and general knowledge.

As far as literacy was concerned, the parents in urban areas were said to provide their children with good-quality and highly-recommended children's literature, to encourage the children to use the public library, to borrow the books of interest to the children, to recite classical poems together, to make cassettes specially for language learning available, and to read books for the children. Parents' talk with the children was thought to be the verbal stimulation most frequently occurring at home. And teachers recognised that this wide range of verbal stimulations was helpful in strengthening and expanding facilities in language and general knowledge. The teachers said that some of these parents bought their children encyclopaedias through which the children could acquire structured knowledge. Almost all of the parents were said to take their children on special visits, such as to museums. The teachers emphasised that there was little intentionally planned or

deliberately provided to develop the children's numeracy. It was supposed that children acquired number facts and basic arithmetic operations as a result of everyday experiences. These middle-class parents were said to restrict television viewing to programmes which were stimulating and educational, such as language learning, wild life and news broadcasts. Children from these homes were described as being able to speak complete sentences, make their points, communicate with others for social or other purposes and write very well in relative terms.

As mentioned previously, children in the suburban areas were described as being at a great disadvantage through lack of stimulation to aid language learning. It was explained that this disadvantage in part resulted from the fact that the parents themselves lacked language competence, time, and the relevant information, needed for improving the children's literacy. It was pointed out that these parents tended to pick up books randomly which appealed to the children and seemed on the surface to be closely related to textbook matter. Special language-textbook cassettes were found to be the most popular learning aids which recorded the complete themes of two volumes of language textbooks verbatim. As the teachers explained, this kind of technological product led the children to become accustomed to a stimulus-response mechanism, in learning which led, more generally, to rote learning later on. As a result, such children enjoyed imitating the sounds, pitches, and intonations made in the cassettes. At worst, as the teachers indicated, such children had these auditory segments only on their lips and remembered the complete themes by heart without real understanding of what those sounds were meant to be. This was described as singing songs without knowing the scripts. Magnetic phonetic mobile tables and jigsaw puzzles were found to be better materials aiding language learning. It was explained that these tables and puzzles enabled the children to recognise the correct array of phonemes through the games. The teachers gathered that the parents still encouraged their children to learn language through this kind of mechanical approach for the purpose of compensatory education despite the awareness of the negative effect of learning by rote. However, the teachers strongly criticised the fact that, without the parents' direct guidance, the children failed to benefit from those materials or technological products even at a basic level at home. It was said that, having played with those learning aids three times, the children were tired of them. Television programmes were widely recognised as one of the most powerful media affecting thinking,

acting, and the behaviour of the children from the suburban areas. The teachers in these areas all made very serious criticisms of the effects of poor-quality television programmes on the children. It was explained that these programmes used up most of the spare time of children who were not allowed to go out. These television-addicted children were described as imitating the inaccurate and inappropriate usages, phrases, and verbal expressions, intended to make the audience laugh. Through television, the teachers suggested, the children acquired mostly odd ideas which should not be taken seriously. The teachers pointed out that this kind of child tended to accept almost all of the things shown on the programmes as true.

The video game was regarded as another type of stimulation which led the children in suburban areas to be conditioned to non-reflective thinking. The video games were described as being designed to ask the children to follow the rules of the games, operate certain mechanical sets by pushing certain buttons once target images appeared on the screen. The scores were then based on the results of stimulus-response associations on the completion of every operation. For the teachers, all these technology-based experiences accounted for the children's restricted experiential knowledge, a very small command of language, and limitations of acquiring high-order knowledge and skills. They suggested that the learning experience of these children was primarily based on momentary enjoyment which did not require effort to think. They also pointed out that playing with video games kept the children away from important routine of ordinary life, such as meals, study, homework, and sleep. It was also said that, in the worst cases, these children were bored quickly with school materials and learning tasks which did not contain as vivid, colourful, and exciting content, as those involved in video games or soap operas on television.

For all of the teachers, the children's numeracy developed better and faster than literacy and far fewer learning aids provided at home were concerned with mathematical thinking and skills. Most of the children in suburban areas were said to be particularly good at mental arithmetic of addition and some could even count up to one thousand. The teachers explained that these children had to learn to make use of money and countable objects in order to manage their lives. Meeting the demands inherent in everyday experiences was suggested to be the foremost factor

leading the children to benefit from special awareness, necessity and application of the pragmatism of mathematics.

Three types of kindergarten experiences were identified, as far as learning materials provided were concerned. A small number of kindergartens in the urban areas were said to provide the children with open-ended education. It was specifically explained that the learning activity and learning tasks were planned to help children develop at their own rate. This kind of kindergarten was described as following the Western ideals and practices of early childhood education. The children in them covered a wide range of the learning activities despite the fact that language and mathematics were still given more weight than other activities. The teachers emphasised that this kind of pre-school pursued and valued the children's creativity and imagination. However, as the teachers revealed, two weeks of phonetic teaching prior to the start of school was undertaken in these kindergartens due to parental pressure. Some kindergartens in urban areas were described as providing a combination of preparation for Primary 1 and the development of the whole child. As the teachers indicated, children in this kind of kindergarten learned to recognise and produce numbers, phonetic symbols, Chinese characters, do the sums and mental arithmetic - all of which represented a good preparation for work in the reception class - and at the same time took part in activities specially designed for young children, such as play, handcraft, dancing, music, drawing, and so on. The teachers in the suburban areas indicated that their pupils had preparatory education for Primary 1 for the most part when being in kindergarten. This meant that these children were drilled to practise what would be taught in the reception class.

It was widely criticised that, in these preparation-centered kindergartens, the children's underdeveloped motor coordination was over-stretched to control the pencil to write words involving many strokes and put them together within small spaces in a short time. The teachers emphasised that the children could not do the written work properly when starting school because they got into inappropriate habits in handling the pencil. More importantly, as the teachers stressed, the children acquired inaccurate subject-specific knowledge and skills due to poor quality of teaching in kindergartens. The teachers pointed out that these inaccurate learning experiences caused great difficulties to teachers and children alike, when they had to redo the subject matter in more accurate ways. Of the teachers'

criticisms on inadequate learning experiences acquired in kindergartens, learning phonetic symbols came into prominence. It was indicated that the children in poor quality kindergartens learned to code syllables in a synthetic approach, whereas they did it in an analytic approach in the reception class. It was suggested that those who learned to read with the synthetic approach became machines of coding phonetic symbols for the most part and faced great difficulties in understanding the meaning of the whole theme. It was revealed that the analytic approach enabled the children to have an accurate and easy way of processing language modes and gaining meaning within the predetermined context.

The main stream of learning programmes provided in school was identified as the books on four academic subjects and language in particular. The teachers said that the books by and large acted as an essential source of all kinds of school performance, such as, the lesson activity, practical work, workbook tasks, homework, quizzes, and paper examination, so forth. The thematic matter involved in the books was seen as the main stream of learning materials encountered by children. It was pointed out that neither teachers nor children could impose their own meaning on the themes of the books. The teachers all suggested that good preparatory education for Primary 1 received in some kindergartens led these children to have a likelihood of a good start but, more importantly, they had a wide range of general knowledge and adequate language skills which had prolonged positive effects on the children as they went through school.

#### *The structure of activity schemes*

There appeared to be a common view among the teachers that the quality and quantity of the children's learning experiences were affected by the way in which learning activity was structured at home. As the teachers explained, the parents from suburban areas did not develop fixed schedules for learning activity. Neither did they plan the activity in a constructive way. These parents mostly asked their children to do reading, writing, and counting, whenever they wanted. More significantly, the parents were said to be open to the fact that the learning activity could be interrupted by family events, no matter how trivial those were. Under such circumstances, as the teachers suggested, the children's learning experience was not organised, continuous, or complete at all. Some of the teachers particularly stressed the negative effects of this kind of spontaneous structure of the learning

activity. They pointed out that the children could stop their commitment to learning activity wherever they were. It was revealed, as a result of poorly-organised activity and interference from family events, that the children did not have opportunities to be aware of the existence and limitations of time related to the learning activity. More specifically, these children were said to be unable to know and learn how to allocate time to the learning activity and work provided. This kind of disadvantage was generally regarded as causing difficulties for the children when meeting the demand for the accomplishment of the learning tasks in time in the reception classes.

In the case of the parents in urban areas, there appeared to be a rather different picture. It was described that the parents in these areas by and large arranged certain learning activity in a fixed period of time, although most of them put their children's interest first. Some of them were said to plan the learning activity concerned with specialisms which varied from day to day in very constructive way, such as playing certain music instruments and practising writing composition. However, the teachers suggested that almost all of the working parents found it very hard to keep their plans as structured as they wanted. Under such circumstances, their children learned to dodge the loosely-structured activity.

From the point of view of the teachers, activity schemes introduced in kindergartens were more structured and time-divided in comparison to those planned at home. The teachers explained that the children in kindergartens engaged in thematic activity schemes which proceeded to multiple activities over each period (90 minutes). It meant that children, by and large, engaged in two or three kinds of the learning activity such as reading, counting, game-playing, self-monitoring activity, story-listening, word recognition and writing, in that period. The teachers thought that children's interest could be induced and sustained due to a short spell of attention paid to each piece of activity and the variation of activities. More significantly, it was stressed that kindergarten teachers had autonomy in organising the learning programmes and allotting time to the programmes in their own terms. The children were said to be able to go about the learning tasks at their own rate, allowing them to be more relaxed in enjoying the activity. Unlike the case in the reception class, it did not matter whether or not the children completed the learning tasks in time. The children did not have to meet the demands for keeping up with predetermined progress and putting the completion of the work first, as they did in

reception classes. More importantly, as almost all the teachers recognised, kindergarten experiences led the children to become conscious of the existence of time and the structures of the learning tasks, and their relationships with performance and achievement. There was a consensus among the teachers that the children with kindergarten experiences adapted to timetables and progress schedules implemented in school much better than those who did not have kindergarten experiences.

#### *Requirements for performance and work*

Meeting strict requirements for performance was regarded as one of the immediate and important demands facing the children on starting school. The teachers explained that the parents did not make their requirements for the children's performance certain, clear, and firm enough, to lead them to make the effort to do the work. It was further pointed out that parents softened their requirements to take account of both their intimate relationships with the children and children's immaturity. As the teachers inferred, the parents believed that schools and teachers were in a better position to impose requirements upon children. Some parents were described as believing that the more they required, the more their children became hostile towards the learning tasks, and the less they would work. Without strict imposition of requirements for performance on the learning tasks planned at home, the children were said to believe that they could produce any kind of the results they wanted. The teachers emphasised that, under such circumstances, the children were not aware that their engagement and effort would be futile, and the results would not be taken into account, if they did not meet the requirements set for performance. The parents in urban areas were generally described as imposing the requirement for the completion and the quality of the work as long as their children were prepared to engage in the learning tasks. It was more specifically pointed out that some of the parents particularly required their children to bear in mind the components of good results, including tidiness, the rules of actual operations, including the steps of procedures, and the limited time given to them.

Kindergarten teachers were also criticised for their failure to help the children to recognise the necessity of meeting requirements and standards when they were in a better position to do so than the parents. In attempting to avoid upsetting the parents and the children, in order to retain them at the kindergartens as long as

possible, kindergarten teachers allowed the children to avoid the requirements or taking the standards of outcomes seriously. The children were said to be encouraged to go about the tasks in their own terms. This was thought to lead these children to face great difficulties in keeping in mind demands for necessary components of actions and results in school. At worst, as the teachers pointed out, these children felt very frustrated and at a loss, when they were asked to redo the work which required them to meet certain requirements.

#### *Evaluation of learning outcomes*

From the teachers' point of view, evaluation of outcomes directed the content and orientation of the children's learning experiences in the reception class. In contrast, of course, parents would not give any specific and regular form of systematically assessing any learning they encouraged, although children in urban areas were given occasional quizzes which tested the children's vocabulary, numbers, and the sums. These parents were described as asking their children to practise what they failed to get right. The teachers in suburban areas revealed that most of the parents did not take any measure to evaluate their children's learning informally, because they themselves did not know the subject matter.

In the kindergartens in urban areas, teachers indicated that almost all kinds of learning outcomes were fully appreciated in their own right. The kindergarten teachers were said to be more concerned about imposing meaning on the children's performance. Children were described as being encouraged to be proud of themselves, by being able to achieve something, no matter how it would be looked at by others. In contrast, the teachers in suburban areas pointed out that the kindergarten teachers in their areas, by and large, carried out the same patterns of evaluation of learning outcomes as Primary 1 teachers did, i.e. checking the accuracy of phonetic symbols and Chinese characters, and of basic arithmetic operations of addition and subtraction. Although the children in this kind of kindergarten experienced similar patterns of evaluation, most of them still found it very difficult to cope with more frequent, demanding and unfamiliar examination contexts in the reception classes. As the teachers explained, lack of subject-specific knowledge and skills, and inability to produce the answers fast enough, were the causes for the children's inaccurate responses to tests. The teachers emphasised that many children knew the answers to the questions or solutions to the problems, but



they failed to put them down on the answer papers in time. Nevertheless, the teachers all said that they still had to evaluate the children's learning outcomes in the form of paper-pencil tests as frequently as possible although they did not think these informal tests were the sole ways of assessing the children's learning outcomes. Mrs A criticised this kind of evaluation in the written form as making the children focus only on the matter involved in the books and on remembering it by heart. For her, the children's learning experiences were reproductive, fragmented, factual, and mechanical. However, most of the teachers explained that the children had to be confronted with frequent tests, otherwise they would not work hard. It was also said that the parents could help prepare the children for the tests and be informed about their progress from the test results. The teachers admitted that every child, on the average, took two quizzes for each unit in the textbook. In other words, there were about six tests to take every week.

It was clear that there were marked differences in the children's experiences of similar patterns of learning activity and material provided in three important settings. In attempting to identify the aspects causing children's difficulties in making progress in terms of their previous experiences, it was necessary to examine the demands inherent in the classroom context within the reception classes.

#### **4.2.2 The immediate contexts of the reception class**

Classroom-based observations showed that the children's learning experiences in reception classes were affected profoundly by five contextual features: the language-dominated interaction, book-based teaching and learning, the work-oriented requirement, and the outcome-valued reward system. These will be looked at in turn.

##### *Language-dominated interactions*

It was noted that there were three basic targets which dominated the classroom interaction in which the children were involved: the teacher, the learning task and material, and the classmates. The teacher-led interaction was the most influential classroom event in directing the children towards the processes and outcomes of learning, and language dominated this kind of teacher-led interaction in all circumstances. The teacher-led language-dominated interaction led to information

being given to the children in two modes: the teacher's spoken and written language. The teacher's spoken language contained the detailed information while written language was used to emphasise the key points. Throughout the teacher-led language-dominated interactions, the children were observed to proceed through two levels of processing: processing of linguistic forms and processing of the main ideas embedded in the information.

It was seen that the teachers' discourses were superficially characterised by being formal, abstract, context-free, and having a continuity of linguistic forms. It was noted that the teachers' spoken language did not suffice to ensure children's understanding, because it often lacked concrete reference, detailed and clear descriptions from the perspective of the children, necessary pauses, context-specific discourses, purposive dialogues, and immediate feedback. Under such circumstances, children were hardly able to identify even the key points and construct their own meanings out of fast and abstract stimuli. The children replied to questions in a few single words and phrases, repeating what had been said by the teachers. This indicated children's confusion and difficulty in catching the teachers' instruction as a whole. This phenomenon was particularly notable in the initial phase in the suburban classes. It was seen that these children did not acquire or familiarise themselves with difficult subject-specific knowledge, terminology, referential targets, complex grammatical structures and long discourses. The teachers seemed entirely unaware, when delivering information orally, that their speedy spoken modes, without concrete and relevant context, caused difficulties for the children. Any pauses within the teachers' discourses were mainly to draw the children's attention to aspects of the instruction. It was shown that children took part in interactive communications only on the occasions in which the teachers asked the children questions to see whether or not they had paid attention to the lesson.

Five all-pervasive phenomena were shown to be the relevant indications of the children's difficulties in following the teachers' spoken language. Some of the brightest children expressed their puzzlement directly and asked the teachers for detailed explanations of what they could not understand. Some of the children who were lagging behind were seen to watch what the brighter children did and to copy it, whereas others asked the child sitting beside them about what had been said. It was often observed that a few less able children were very curious about what was

going on and turned their head aimlessly to see what the others were looking at. A very few sat still and did nothing until the teachers asked them whether or not they understood what had been said. It was found that most of the replies of the less able children were 'I don't know'. These five prevailing responses suggested the children's general difficulties in comprehending the teachers' instructional language. In the suburban classes, most of the children were from dialect-speaking families and were seen to have very limited direct experience of Mandarin - the official spoken language the teachers used. In respect of Mandarin and dialects, there appeared to be many differences in phonological and lexical features. This might well be the main reason why such children found it very hard to follow the lesson activity and interactive communication in the initial phase of school. Sometimes these children had to express their thoughts and understanding to the teachers in dialect in order to make fruitful points fluently.

It was shown that the teachers' written modes were generally duplications of thematic matter contained in the textbook and workbook. Children had less difficulty in recognising the single words or phrases written by the teachers on the blackboard in the larger size, than following the teachers' discourse alone. As seen, the children had to meet two types of demands simultaneously: decoding the unfamiliar and meaningless symbolic representations separately, and then setting up the relations between the representations. There were four kinds of notable responses indicating children's difficulties in coping with these two interactive and simultaneous types of demands: (1) sounding out and writing the phonetic forms inaccurately and incompletely; (2) failing to recognise or to write the syllables; (3) being unable to make sense of tonal symbols in accordance with the targeted syllables; (4) failing to read the text in phonetic symbols and to grasp the meanings from them.

It was clearly shown that the children acquired knowledge and skills through the teachers' written language and spoken language but the latter dominated the children's acquisition in the relative terms. The key to accessing this kind of language-dominated interaction was seen to be the knowledge and skills of language, thinking in the abstract and using domain-specific matter. Observations showed that teaching and learning took the form of teacher-led and language-dominated interaction which proceeded to follow the textbook and workbook topics in strict order, as they were planned.

### *Book-based learning and teaching academic subjects*

As mentioned previously, activity schemes in Taiwan reception classes were carried out based on a syllabus in which six subjects and extra-curricular activities are outlined period by period. However, as observed, four academic subjects were given paramount importance; of these, and language and mathematics in particular. It was noted that the periods allocated to two minor subjects and extra-curricular activities were frequently reallocated to cover incomplete work in the four academic subjects, and language in particular. Classroom-based teaching and learning concentrated only on the mastery of learning of academic matters, with special attention to language and mathematics textbooks. The pursuit of academic achievement was seen to come first, as far as time and effort in classroom activity were concerned.

The teachers, by and large, were seen to carry out the teaching session using the following activities: (1) reading the theme of the lesson in the book for the class; (2) verbalising the definitions of key words, instances, objects, pictures, symbols, the written instructions and background information involved in the book, and writing them on the blackboard; (3) revealing key points which took the form of facts, knowledge, and skills; (4) demonstrating the actual operations; (5) reviewing the main ideas; (6) repeating (1) and (2); (7) asking the children questions about the definitions of the elements outlined in (2) randomly; and (8) repeating (1). The children were unlikely to take an active part in these activity schemes, except in the circumstances when the teacher taught the children to write or do arithmetical operations of addition and subtraction. In other words, the children rehearsed actual operations only in this kind of learning context.

It was seen that the children faced the demanding context in which they had to absorb knowledge and skills incorporated in the textbooks, instantly. Observations of two target classes showed that the children had to work through five levels of associations of information given to them in order to learn, perform, and achieve the goal as scheduled: (1) various kinds of the information which took the form of written scripts, concrete and semi-concrete objects, illustrations, geometrical representations and symbols in either visual or auditory modes; (2) visual and auditory forms of the information; (3) previous experiences and existing knowledge and skills intellectually and linguistically related to the information; (4) factual and

procedural information and actual operations; and (5) the same pieces of the information given by the teachers or involved in the books. The teaching moved through this hierarchy of levels of associations of information and operations. These five levels were perceived to demand of the children, speedy mental processes, sufficient cognitive capacities and quick actions. But the limited time allotted to many of the learning tasks made it difficult for the children to work at all five levels. As a result, it was observed that the children's learning outcomes were far from satisfactory. It was noted that the more levels of associations that could be established, the more the children's mastery of learning could be achieved, and the more rapid progress could be made. Those who could not set up even the first level of associations were seen to experience the greatest difficulties in understanding the information and acquiring knowledge and skills. It was found that this kind of child held on to the first level all the time, no matter the teachers were proceeding to other levels. It was clearly shown that there were more children in suburban areas, than those in urban areas, who could not reach more than the one level of associations, while urban children could reach more and higher levels.

Secondly, it was found that the children were explicitly and implicitly required to accelerate the process of perceiving, understanding, categorising, and memorising the subject matter, as fast as teachers' oral language was made. In the classrooms, as observed, the children were expected to shorten mental processing of the information given to them, due to shortage of time created by the strict schedules. Those who made rapid progress were seen to respond to the information more quickly than others, whereas those who made slow progress were observed to need longer time than given in order to complete the processing of the information. It was noted that the lesson activity moved on to the next phase before these children completed processing and made sense of on-the-spot information. They then became inattentive, impatient, and tired of the targeted objects and matter. Thirdly, the children met the demand for thinking and responding to the information given to them in a close-ended, strictly correct, and context-specific way. As revealed throughout the observations, almost all of the learning matter embodied in textbook content was factual knowledge. Thus, the theme of teaching was seen as an introduction to 'what it was in the book' instead of 'how and why it was' and 'what it could be meant in other contexts'. It was found that the book was the only context to which the learning matter and its meaning were relevant. Thus, it was no surprise to find that children found it hard to achieve transfer of learning, namely,

applying their acquisition of knowledge and skills to any context which took a different form from that of the book. It was mainly because, as observed, the children all learned the subject matter involved in the books in a context which was not open to questions, opinions, discussions, criticisms, alternatives and subjective interpretations. In short, the children were required to perceive, understand and apply the information in exactly the same ways as it was presented in the books.

Overall, the children and teachers alike stood by what was presented in the textbooks and what had been planned in the workbooks. However, informal talks with the less able children suggested that their learning experiences in the reception class were essentially a result of relating their previous and existing life experiences, intuitive knowledge and practical strategies to the new learning tasks. More of the suburban children, in particular, showed their over-reliance on this kind of open-ended experiential knowledge and skills. Observations indicated that the children had to face, size up, and make sense of, this big difference in the context to which the information was attached in order to achieve optimal learning and performance.

#### *Work-oriented requirements*

It was noted previously that one of the biggest changes children faced in starting school was that school work had to be done in time. Observations suggested three types of demands imposed upon the children's accomplishment of school work. First, no programmes were seen to take the form of group activity or collective cooperation, so that children had to engage in school work independently. Many of the children, used to over-reliance on others, did not start their work without the teacher's close guidance, step by step, in the initial phase of school. Some kept asking the teachers questions, point by point, to be sure of the right direction. These children did not even try to think and sort out the solutions to the problems on their own in the first place. The teachers generally required the children to complete the work in time, rather than to pay attention to the quality of the results. It was then not surprising to see that poorly completed work was more favoured than unfinished work of high quality.

The children were also perceived to come against other demands for performance on school work, namely, precise formats and strict corrections of learning outcomes. Some were seen to be indifferent to what they were exactly expected to do, while

others seemed not to be aware of these intrinsic demands, unless the teachers stressed them repeatedly. Children did not recognise that perceptually and geometrically approximate representations of a stimuli were incorrect. For example, children failed to recognise, or ignored the fact, that the meaning of a Chinese character depended upon precise structures and exact physical arrangements of its integrated strokes. It was found, for many children, putting a left-hand dot of a standard Chinese character in the middle or in the right-hand position did not make any difference for them, although the teachers stressed that the character made in the latter situation could not make any sense.

#### *Outcome-based reward systems*

The reward systems were seen to motivate the children to achieve the goal of the mastery of learning and produce good results. It was found that the teachers all put distinctive marks on the children's work to symbolise good performance. They would give the children a token if they had got a certain number of good marks, and children could exchange a certain number of tokens for a prize. No sooner had the children had their workbook corrected than they looked for the special marks, totalled up these marks, and tried to figure out the number of the marks they had got since they were rewarded last. In attempting to get more special marks, some children were seen to copy the best children's work or to ask someone to do the work for them, if the situation permitted. In other words, such children became opportunists. They did not even try to make the effort to think and perform the tasks, and simply wanted to get rewarding marks. It was found that none of the children asked the teachers, or probed into the results, to understand why they had got some items wrong. The two target teachers were seen to encourage the children to have inaccurate answers corrected before claiming the the rewarding marks or tokens. Interviewing the children suggested that the favourable results leading to rewarding marks were those presented in exactly the same way as the teachers instructed and the books showed them.

The findings of the fieldwork of the pilot study concluded with the general comments from teachers that there were more pupils than they had thought who were having difficulties with their work and were already getting well behind the required standards. The teachers suggested that these unsatisfactory consequences were affecting some two thirds of suburban children and one third of urban

children in each reception class. The extent of the problem can thus be seen to be serious, and to justify the further work in understanding its causes proposed for the main study.

### **4.3 The practical insight of the pilot study into the main study**

As far as the development of the specific rationale for the fieldwork of the main study was concerned, the practical insight of the pilot study was fivefold: the immediate difficulty, the focus, the sample, the research methodologies, and the strategies and procedures. These will be de considered in turn.

#### **4.3.1 The immediate difficulty**

As found in the pilot study, the most difficult task for the researcher was to select the schools and gain their consent to the study, and have the teachers' permission to enter their classes. Even where the school principals and headteachers agreed to take part in the pilot study in principle, there were still special difficulties in getting the teachers to take part in the fieldwork sessions. Although the personal relations of the researcher to the teachers were helpful in building up the trust and rapport, they had disadvantages too. The teachers felt terribly anxious and reluctant to reveal their ignorance and possible inadequacies. It was found that this kind of anxiety and embarrassment was greater among the teachers who were closer to the researcher than others, when replying to the questions which they had never thought about before. Direct experience with the teachers throughout the pilot study suggested the need for a longer period of time for sampling, prior to the start of the main study. It was necessary to gain as much specific information as possible in advance about the schools and the teachers who were likely to take part in the research project. Mutual communications between the researcher and the teachers should take place early enough to build up a consensus about commitment to the fieldwork.

Secondly, there was an immediate problem in revealing the research schedules to the teachers beforehand. It was found that the teachers were too frightened by the focus on their performance and work to be prepared to carry on their part in the class normally in the period during which the fieldwork was due. Therefore, it would be wise to give the teachers involved in the main study an idea that the



fieldwork focused only on the children's performance. This disguised intention also avoided the high likelihood that the teachers deliberately performed optimally on the days when they were observed or interviewed. The role the researcher played in the classrooms involved another difficult decision which had to be made prior to the start of the fieldwork. Most of the teachers put forward an idea, coincidentally, that the researcher could be seen as a university student who was keen to watch children in the classrooms. It was explained that university students were so neutral and welcome that the children would not have confusing role-recognition between the teachers and the researcher. Neither would they have unnecessarily psychological fears of the researcher being a strange adult or another authority figure. It was explained that regarding the researcher as a model of knowledge and discipline could encourage children to make good performance to the best of their abilities and behave themselves in the classrooms. This disguised role had its positive effect on the pilot study so it was decided to adopt it again in the main study.

Furthermore, it was fairly difficult to set out time schedules for carrying out interviewing and observations which could come to terms with personal preferences of the eight teachers and the incompatible variation of officially-regulated timetables. With the assistance of the headteachers, the predetermined timetables implemented in the eight classes were adjusted to the research schedules. It was necessary that this kind of negotiation for the main study should be made as early as possible because it required enormous effort and a great deal of time to achieve.

#### 4.3.2 The focus

It appeared to be a significant finding that an alarmingly large number of school-age children could not cope with demands for learning and performing academic subjects and language in particular. It was clearly seen that children simply sat still, listened to the instruction and had few opportunities to present their learning outcomes during the lesson sessions. In contrast, children's performance on the workbooks was seen as the main stream of subjective reflection on, and objective indications of learning outcomes. In the meantime, children's independent engagement and accomplishment of the academic tasks provided the researcher with the best access to identification of their difficulties in learning subject matter,

performing school work, and making progress. In attempting to find the best way to achieve the ultimate aim, that schooling is profitable and appealing to children and more children can succeed at school than those found in the pilot study, the suggestion made for the focus of fieldwork of the main study was the children's difficulties in coping with learning tasks of academic areas.

#### **4.3.3 The samples**

In attempting to explore multiple causes for children's difficulties, the main study would require a range of different data sources from all those closely related to children's school performance. Thus, it would be essential to select children, parents and teachers who could provide distinct evidence representing the reality under scrutiny. In response to the main concern about difficulties facing children, it seemed that the main study should focus, in particular, on children who found it hard to cope with the demands inherent in the academic tasks. A smaller comparison group of pupils making good progress would also be necessary in order to stress the importance and the significance of crucial factors the poorly-performing children shared or lacked.

Direct experiences of classroom practices throughout the pilot study suggested that the main study should avoid teachers who were lacking in any of the following characteristics: (1) failing to control classroom discipline; (2) showing a lack of seriousness about their work; and (3) lacking the teaching competences needed to carry out activity schemes steadily or to cope with additional strain of being observed by the researcher over several months. The pilot findings also indicated the effects of school catchment areas on the children in many significant aspects, explaining the difference in learning experience with special reference to difficulties. Thus, the reception classes sampled in the main study would have to take this environmental variable into account.

#### **4.3.4 The research methodologies and strategies**

This pilot study provided direct indications of the relevance and appropriateness of qualitative methodologies and strategies for collection of the required information about teaching and learning in reception classes. It was shown that data acquired by interviews and observations were complementary and cross-linked. It was clear

that complementarity of data was particularly worthwhile to ensure richness of data and completeness of the results. It was also clear that the nature of the required information necessitated a plurality of research methods. Specifically, multiple research approaches would capture the complexity of the situation, the multiplicity of individuals' attributes, and the dynamics of the interactions between the situation, individuals and outcomes. This would be ensured through a triangulation of research methods. Comparing the differences and similarities of the properties of the factors considered to be important required specific instances, phenomena and descriptions, which could be best represented by focusing on individual children as case studies. In analysing the data, categorisations of the factors would require a reference framework to organise the concepts, acting as provisional rules delimiting categories from the raw data.

The children would be essential contributors to the main study, as they would provide the first hand evidence of their own experiences and difficulties. Although children did not take part in the pilot study as a whole, occasional interviews and observations of individual children suggested the importance, the necessity, and the feasibility of collecting data from children aged six. However, well-recognised difficulties in working with young children, and direct experiences gained in the pilot study, indicated that special human relation skills, personality, and language facility were needed to make the immediate context in which children interacted with the researcher as natural and pleasant as possible.

It was clearly shown that children's work was substantially useful in focusing and drawing out the teachers' thoughts about the situation. As far as the teachers were concerned, the researcher's sincerity and openness was the foremost contributor to the rapport with the teachers and to the elimination of their fear of possible inadequacies being exposed by the research activity. Although video-taped observations could capture every piece of vast amounts of information flowing simultaneously, they were not feasible for the main study because of high costs, the conservative atmosphere of the schools, and the teachers' negative reactions to this kind of technology. To overcome the inevitable disadvantages of relying on field notes, two major tasks were identified from the pilot study. First, a broad schedule would be developed, focusing on aspects definite and clear enough to ensure that the researcher could capture and record events easily and immediately, whenever they occurred. Second, to design specific notebooks based on logical sequences of

time and critical instances happening on most occasions in the classrooms. It would be essential to practise note-taking in these specially designed notebooks in order to be efficient in recording the field data.

#### **4.3.5 The procedures**

Since starting school is a continuous process and consequence of children's development, it would be vital to explore the reality and underlying aspects of school, right from the start of the school year, and to continue the fieldwork until the children stopped going to school for a substantial period of time. The fieldwork of the main study would thus be carried out over a prolonged period of time, but with a small sample. The pilot study had made it clear that it would be impossible for one observer to cover the whole range of effects in reception classes, except by focusing on a relatively small number of children, and on a few classes.

Secondly, it was found that interviews, observations and content analysis undertaken in an open-ended, participant-centred, instance-specific, and situation-dependent approach consumed a great deal of time, energy, and intellectual resources. Thus, it was absolutely necessary that the researcher should have one or two days out of the class and reflect, review, analyse, and comment on what had been found and set up more relevant, sensible and feasible schedules for the fieldwork in the coming week. Thirdly, it was easier, more effective and more appropriate to complete scheduled pre- and post-task interviews and classroom-based observations with a teacher within the school day when events had occurred. Putting off interviewing would lead the teachers to have difficulties in explaining certain points and actions in retrospect.

#### **4.4 Concluding discussion**

Overall, this pilot study identified particularly important issues which profoundly affected Primary 1 teachers and the children alike. It was clear that there were differences and similarities of children's learning experiences acquired in different settings before starting school. It was suggested that children's difficulties in starting school lay in their inability to adapt themselves to a marked change in people, materials and environment, all of which affected their learning experiences in the transition to infant school. The findings indicated the importance and the

significance of previous learning experiences to those dominating the context of the reception classroom. School demands were enormous, different, unfamiliar, and difficult in comparison to those encountered previously by children.

Of five crucial aspects identified to be important to children's previous experience, the role of knowledgeable adults and the learning programmes were more influential than the other three aspects. The former factor predominated in both the types of learning activities, the materials provided, and the overall learning environment. The latter factor affected the relevance, quality and quantity of learning experiences. It was indicated that literacy and numeracy were the main stream of children's learning experiences. The former was intentionally nourished by programmed materials and activity whereas the latter evolved through children's everyday experiences of scenarios of the real world. It was implied that the structure of activity schemes and the evaluation of learning outcomes were related to children's attitudes to school work and motivational orientation. The evaluative system was only implemented in the reception class to assess the children's learning outcomes, but it implied the reproduction of the subject matter of the textbooks. The analyses of teachers' comments showed that there were qualitative variations in children's learning experiences in terms of family background, the subject areas, the quality of pre-school education, and parental involvement. The children from working-class families acquired a narrow band of inappropriate subject-specific knowledge and skills in poor quality kindergartens. This kind of unsatisfactory learning experience was exacerbated by lack of guidance and help from the parents who generally worked for long hours and were poorly educated. In contrast, the children from middle-class family acquired a broad body of relevant knowledge and skills in better quality kindergartens. This kind of satisfactory learning experience was consolidated and expanded by sufficient guidance and help from the parents at home. This contrasting experiences implied a multiplicity of advantages and disadvantages facing these two groups of children. The multiple advantages suggested the likelihood of having a good start in school and making good progress quickly, while the multiple disadvantages seemed likely to lead to a spiral of poor progress, low self-confidence, and alienation.

Classroom observations identified five features which dominated children's learning experiences in reception classes. Language-dominated interactions suggested overwhelming demands, imposing upon the children requirements for

language competence which left other communicative avenues unexplored. Book-based learning and teaching highlighted the fact that the lines of thought of both teachers and children were channelled by the set of the books. It seemed that reception education was the departure point for a formal form of schooling. It meant that children - the subjects of knowing - had to follow the books - the objects of knowing - in absolute terms. Work-oriented requirements stressed the necessity of adult-like working practice - independent engagement, prompt completion and precise results of the work. The outcome-based reward system led children to look at the results rather than reflect on what lessons they could learn from the mistakes corrected by the teachers. It did not motivate the children to refine learning outcomes. Instead, it reinforced the children in the habit of paying attention only to what had been told by the teachers and presented in the books, doing the work for rewards and appreciating their achievement superficially.

The pilot study confirmed the necessity, and the appropriateness, of qualitative methodologies and strategies for investigating the influences on children's progress. Personal direct experiences led to empathetic understanding of the situation, the teachers, the children, and the pilot work overall was of enormous benefit in deciding how to plan the design of the main study.

## **CHAPTER 5**

### **Design and Implementation of The Main Study**

The present study is firmly located in the qualitative paradigm in line with strategies of methodological triangulation, categorisations and comparisons. The pilot study suggested a way of tackling the main study as a whole. As previously proposed, described, and justified, the study was intended to identify and explore significant aspects of children's difficulties in coping with the tasks in the earliest phase of schooling. The data was collected in different forms to facilitate triangulation. The data was then placed on index cards which were then sorted to identify conceptual categories according to their similarities and differences in the definitions and properties represented by the data. Before starting to carry out the fieldwork, some important points had to be taken into account as norms of research procedures.

#### **5.1 Preliminary considerations**

Most of the requirements for doing research are laid down primarily for a conventional notion of science, which are not appropriate for the present study, as qualitative research is essentially emergent from the field, rather than derived from a theory or a predetermined set of hypotheses. There were very important questions to be addressed from the earliest stages of the design. As Lincoln and Guba (1985) suggest, the following points should be taken as a preliminary for considerations of fieldwork: (1) specifying the focus, (2) considering the degree of fit between the focus as set and the enquiry paradigm as chosen that could be brought to bear on it, (3) considering the fit between the chosen paradigm and the knowledge domains and what would be relevant to categories, (4) deciding where and from whom data should be collected, (5) considering the nature and scope of successive phases, i.e. orientation, review, focused exploration, and closure, (6) considering all feasible alternative aids of collecting data, (7) considering data-analysis procedures, (8) planning a system of coding data for the study prior to actual fieldwork implementation, (9) considering decisive points for closure, and, (10) planning for the validity.

The qualitative approach was designed to avoid any unnecessary constraints on either the respondents or the situations under study. The implementation of the fieldwork required the following early attention and effort: (1) making initial contacts, (2) gaining entry into the school, (3) negotiating consent, (4) building rapport, (5) sustaining trust, and (6) identifying the subjects and objects under the study. Based on the aims of the fieldwork, the paradigm, and these preliminary considerations, three main research methods were employed to collect data: interviews, observations, and content analysis.

## **5.2 Research methods**

The main study was primarily set up along three lines: (1) methodology and epistemology underlying social and educational research, (2) the indications and suggestions of the previous research and development studies, and (3) the implications of the pilot study for the research methods of the fieldwork.

Three premises underlay the research methods employed in the main study. Firstly, the field study had to proceed with the highest degree of (1) open-mindedness, (2) real appreciation of the subjects, the situations and outcomes, and (3) authenticity of collecting empirical data. In other words, it was particularly important that the fieldwork was oriented to "let them speak for themselves." (Tesch, 1984, p.5) in the immediate situation, i.e. the reception class in the natural state.

Moreover, there were two main reasons for focusing on specific individuals, instances and phenomena illustrating the children's difficulties in making progress. First, to gain rich and in-depth, instead of shallow, broad and even irrelevant, understandings of the focal points; and second, to overcome the inevitable problem that the researcher was unable to follow all the numerous episodes occurring in the field. Finally, research methods and procedures were set as 'back-and-forth' reflective movements and processes of thinking, implementing, collecting, analysing, commenting, modifying, and gathering of data in the course of fieldwork.



### 5.2.1 The definition and focus set in fieldwork

As reviewed above, the children's difficulties in making progress were caused by the incompatibility between the existing and developing qualities of children and the demands of the school environment. It was revealed in the pilot study that children's difficulties in meeting school demands were largely related to the work children did on the academic tasks. The focus of fieldwork was then decided to be on the factors which might account for children's task performance and difficulties. To achieve the major aims of the main study, the following types of data were required:

1. Categorisations of teachers' perspectives of the tasks of language and mathematics on which the children acted;
2. Descriptions of teachers' task-related instruction;
3. Identification of children's established and developing qualities considered as the aspects important to their performance, difficulties and outcomes;
4. Descriptions of children's thinking, understanding, actual operations, and strategies for the tasks;
5. Analyses of the content of children's work;
6. Explorations of the relationships between children's performance-related qualities and outcomes, task elements, and instructional practices.

Overall, the results of the main study were descriptive and interpretive in nature. The required evidence stemmed from three types of source : (1) personal narrative accounts, particularly concerned with task-based activities of both teachers and children; (2) descriptions of activities, processes, actions, and interactions, involved in the immediate context where the tasks were central to the children's attention; and (3) presentation of telling extracts from children's written products and workbook tasks which indicated the nature of the difficulties experienced. According to the accepted standards relating to research methods and the nature of the required evidence, two major methods of qualitative research were employed in

the fieldwork: depth interviewing and fieldnote observation. The third type of evidence was gained through the means of content analysis.

### 5.2.2 Depth interviewing

Allport (1942), Kelly (1955), Harré and Secord (1972) and von Cranach and Harré (1982) all recognise individual accounts as valuable sources of particular information (Brenner et al., 1985). It is specifically stressed that interviewing is the best access to the point of view of the participant (Schwartz & Jacobs, 1979). An interview, as Dexter (1970) indicates, is purposive conversation. He suggests that the purpose for interviewing involves (1) here-and-now constructions of persons, events, activities, organisations, feelings, motivation, opinions, and concerns, (2) the reconstruction of these entities and experiences in the past, and (3) projections of these entities as they are expected to occur in the future. For practical purposes, interviews can be categorised into two types in terms of the degree of structure. The structured interview is often referred to as a "focused" interview and the unstructured interview as a "depth" interview (Lincoln & Guba, 1985).

In the structured interview, the problem is defined by the researcher before the interview. The questions have been formulated ahead of time, and the respondent is expected to answer in terms of the interviewer's framework and definition of the problem. The unstructured and specialised interview varies considerably from this mode. In an unstructured interview, the format is non-standardised, and the interviewer does not seek normative responses. Rather, the problem of interest is expected to arise from the respondent's reaction to the broad issue raised by the inquirer. (p.268)

As far as qualitative interviewing is concerned, it is vital to leave the structuring and the process of the dialogue to the interviewee, with minimal instructions from the interviewer, and then progressively to proceed with content-specific probings into the particular points on which the study is focused (Neumann, 1987). As defined by Dexter (1970), the depth interview encompasses: (1) emphasising the interviewee's definition of the situation, (2) encouraging the interviewee to structure the account of the situation, and (3) allowing the interviewee, to a large extent, to introduce his thoughts of what he considers as relevant, instead of depending upon the researcher's judgments. Dexter concludes this form of interview is the best way to obtain unique, idiosyncratic, and wholly individual viewpoints. Lincoln and Guba (1985) point out a major strength of the interview that "it permits the

respondent to move back and forth in time - to reconstruct the past, interpret the present, and predict the future, all without leaving a comfortable armchair." (p.273)

Interviewing, employed in the main study, was particularly directed to obtaining the subjective experiences, perceptions, explanations and interpretations related to children's performance on the academic task. Consequently, the accounts of the teachers and parents served as descriptive and interpretive data identifying the task-related qualities of the children. The content-specific interviews with the children led to an understanding of the causes of children's difficulties in doing the tasks. Above all, interviewing employed in the main study was neither exactly a question-answer activity nor a mechanical yes-or-no exchange. The open-ended interviews allowed the research gradually to identify categories, as a consequence of intensive reflections on the specific cases and phenomena concerned with children's performance.

Based on the principles of depth interviewing and the focus of fieldwork, the conversation began with an introduction to the purposes of the fieldwork followed by probings into the interviewees' background related to the children, perspectives on Primary 1 education, and their experiences of children starting school. Having established rapport and gained broad and general background information about interviewees, the dialogue was then directed to probe further into specific points; cases, instances, phenomena, and occasions, elicited as important to children's performance and progress in school. It was essential for the researcher to adjust (1) the style of carrying out the conversation, (2) the terminology used in the wordings of questions, and (3) the attitude towards the interviewees, in order to match individual differences of the interviewees in significant aspects, for instance, educational background, language competences, experiential knowledge, involvement in children's schooling, and attitudes towards the profession of the researcher. It was also vital to develop the dialogues differently from context to context, and question to question, without distracting from the main concern and focus of the interview.

With the teachers, interviewing started with their point of view on the teaching profession, Primary 1 education, the school-age children, and children's starting school in general. Throughout four months of fieldwork, brief pre-task and intensive post-task interviews with teachers were carried out to (1) find out what

their specific perceptions, interpretations, and understanding of the tasks were, (2) ascertain their emphases on task-related instruction and accompanying requirements for children's performance and work and (3) to have their explanations and interpretations of their own task-related actions and children's performance and work.

Furthermore, interviewing of the teachers was conducted under the constraints of the overload of teachers' work with big classes, centralised structural organisations in school, strict timetables, and official requirements for commitment to scheduled progress. Thus, it was worthwhile to prepare concrete work for the children to do and set up time schedules beforehand to allow more relaxing interviewing encounters. The interviews with teachers were tape-recorded and their accounts were transcribed verbatim.

Interviewing of the parents was conducted either in school or at home. The researcher began to interview the parents two months after fieldwork started in the classrooms. Having talked briefly and generally about children's development, the parents were invited to identify, explain, and interpret in detail, the specific factors and instances they believed affected children's performance in school.

Children's written products made in the workbook tasks were used to help to provoke the parents' thoughts. The focus of interviewing under such circumstances was not only on the parents' perceptions of children's performance, but also on the explanations of the results. By contrast, when interviewing parents who dropped into school only for special purposes, there was a big difficulty in asking them to give their detailed view of their children's performance. This was due to the constraints of time and situation as described previously. Consequently, interviewing such parents was directed straightaway to discussing children's performance on the tasks. It was encouraging that most of the parents were able to have a long talk with the researcher about their children at home. Note-taking was the means used to collect data of parents' accounts, as tape-recording was considered to be potentially intrusive in this context.

Since the majority of parents interviewed were at a disadvantage in many significant aspects, for instance, educational background, experiential knowledge, and language competence, it was inevitable that parents' views, by and large, were relatively indirect, commonplace, general, and unidimensional. The parents offered

information more on the critical aspects of the children's previous experiences than on present-day school performance. It was not only because the parents were better informed about children's development in the past, but also because they regarded themselves as lay-people who could not make accurate and sensible comments on the issue raised. More importantly, unlike their counterparts in the United States and Britain, the parents in Taiwan are generally discouraged from involving themselves in school activities. Thus, the interviewed parents did not know enough about their children's schooling to feel confident in answering. However, in the light of the fact that parents play a very important part in children's development, their views were considered to be essential, as part of the process of triangulation.

It is fully recognised that interviewing young children is not an easy task. Damon (1977) suggests that the difficulty of interviewing children lies mainly in (1) inducing and sustaining children's attention and interest in the way in which they are willing to cooperate, (2) establishing rapport for the dialogue, (3) creating a situation in which they feel relaxed as they do at home; and (4) preventing the interviewing situation from disturbances.

Damon goes on to suggest that, until children have experienced the target of the question, they can hardly offer relevant and sensible accounts about it. Pramling (1981) argues that experience-bound and context-dependent wordings of questions enable the children to eliminate unnecessary overloading of comprehension and facilitate self-expression. Being an adult who is a stranger to the children interviewed, the interviewer has to lead the children to an authority-free and test-like-free interviewing situation (Damon, 1977). However, it is vital for the interviewer to be open-minded enough to appreciate individual differences fully, and, at the same time, formalised enough to make comparisons among children's replies (Pramling, 1981). Pramling stresses the importance and significance of the sensitivity of the researcher, besides that of the flexibility described above. She suggests that the required sensitivity be concerned with three areas: (1) the time to stop interviewing; (2) the way to enhance the degree of difficulty in questions along accumulations of children's knowledge and ability; and (3) a mind sharp enough to manipulate varied strategies in order to consistently sustain children's interest and attention.

Direct experience of mutual communications with the children in the pilot study suggested that there were two conditions under which interviewing children became a more difficult and demanding task. One was that the main concern of interviewing was with the academic matters and school work, mostly perceived by the children as 'extraordinarily serious and boring'. The other was that most of the interviewees were those who had not had successful or enjoyable experiences in the aspects on which interviewing was focused. The conversation with the target children, began, in general, with a brief chat about themselves and their perceptions of the work, and progressively turned to a task-specific dialogue. Each interview, which was summarised within the field notes, was filed into a set of exercises incorporated in a unit of tasks in the workbooks and therefore could last for no more than fifteen minutes on average. The researcher was able to catch and sustain the children's attention to a desirable extent, and so collect a substantial amount of information. Such an encouraging consequence was a product not just of the short period of time for interviewing, but also of the focus on the immediate concrete experiences of children as they worked through the exercises. Post-task interviews with the children were mainly aimed at gaining more relevant and clear information about (1) their levels of understanding of the teacher's instruction and the tasks, (2) their ways of imposing meaning on the tasks, (3) the specific strategies and actual operations, and (4) their reasons for particular difficulties in doing the work.

Inevitably, formalised classroom schedules, and the closely regulated syllabus, made it impossible to keep strictly to the prior schedule for interviewing all of the children in each task session. The children who could not be interviewed in the morning sessions were invited to take part in the same classrooms in the afternoon of the same day.

Particular care had to be given to collect data from those who were hardly able to reflect on their own learning processes and difficulties when interviewed after the completion of the task. First, alternative exercises were provided and tailored to the same demands, and formulated in the same ways, as the workbook tasks done by the children. Those who did teacher's work too poorly to make any sense of it were invited to do the alternative exercises. They were asked to explain immediately the points worth noting as they worked through the alternative exercises. Second, the alternative exercises were given to two types of the children to work through, i.e.

those who were unable to give answers about the work involved in the teacher's tasks and those who could not explain why and how they did that work. It was found that the children became more 'expressive' and 'introspective' under these two conditions, and the latter one in particular.

Children's written work was collected, photocopied, and subsequently examined in detail to relate the errors made to the difficulties described by the children and their teachers. This procedure required a form of content analysis (see Section 5.2.4)

### 5.2.3 Fieldnote observation

It is argued that qualitative-bound observation is a direct access to concrete descriptions of social process and context (Hammersley & Atkinson, 1983). A major advantage of direct observation, as Lincoln and Guba (1985) suggest, is that "it provides here-and-now experience in depth." (p. 273) For Guba and Lincoln(1981), in depth observation is a powerful tool.

The basic methodological arguments for observation, then, may be summarised as these: observation...maximizes the inquirer's ability to grasp motives, beliefs, concerns, interests, unconscious behaviours, customs, and the like; observation...allows the inquirer to see the world as his subjects see it, to live in their time frames, to capture the phenomenon in and on its own terms, and to grasp the culture in its own natural, ongoing environment; observation...provides the inquirer with access to the emotional reactions of the group introspectively - that is, in a real sense, it permits the observer to use himself as a data resource; and observation....allows the observer to build on tacit knowledge, both his own and that of members of the group. (p. 193)

McNamara (1980) argues that classroom-based research, through systematic observation using rating scales and category systems, fails to unveil the 'black box' of classroom practices. He specifically points out that quantifiable observation, driven by preconceived and predetermined constructions, leads to the results which fail to capture the full range or the complexity of classroom-based phenomena within analytical hypotheses. Svensson (1985) highlights the significance of observation in attempting to explore distinctively educational phenomena.

To find out the concrete meaning of a relational concept is not the same as applying or using a concept to describe phenomena. The main problem is to find the characteristics of the phenomena corresponding to

the relational concept. Thus the main emphasis is on a description of the phenomena on the level of observation. (p.5)

There are varying means fieldworkers can use for recording observational data, but the taking of fieldnotes is the most usual (Hammersley & Atkinson, 1983). The following are practical suggestions for carrying out and recording observations in the classroom. Like the interview, observations take different forms at different stages of fieldwork. In Douglas's words (1976), the observation is rather unstructured at the early stage, a stage, he terms, of "defocusing" or "immersion". This allows observers to expand their tacit knowledge and to gain insight into what is relevant and salient. Later, according to Lincoln and Guba's suggestions (1985), the observations become more focused, as insights and information emerge. It is also necessary to, as they argue, "interpolate periods of preliminary data analysis between periods of observations" (p.275) in order to allow the development of insights which can be tested through further observations.

From a consideration for the purposes of fieldwork, the nature of the subjects, the settings and the financial sources available, it was decided that fieldnotes should be the method of recording the descriptive data in the main study. To be amenable to the aims, definitions, and focus of fieldwork, as set previously, fieldnotes were mainly comprised of substantial and concrete descriptions of (1) task-related actions of the children and teachers respectively, (2) task-related emphases, activities, processes and contexts, and (3) interactions between the teacher, the children, in relation to immediate contexts, and outcome variables being considered. Above all, fieldnote observations were aimed at (1) noting the features of the phenomena and contexts closely related to task-related performance, (2) grasping them authentically and comprehensively in relation to their nature and (3) setting up the relationship between the factors which might account for children's difficulties in doing the tasks.

Specifically, the task-related observations of the teachers were intended to describe (1) characteristic features of their activities, their use of instructional language, methods, and the actual ways in which the tasks were presented to the children; (2) emphases and requirements for the children to perform the tasks; (3) significant facets of the immediate context related to the teachers' actions; and (4) distinctive patterns of instructional interactions. In addition, the task-related individual-based observations with the target children were used to acquire data on (1) their



responses to the teacher's instructions, requests, and requirements; (2) their procedures in doing the tasks; (3) their actions in working on tasks and strategies adopted to solve the particular problems; and (4) their results in performing the tasks.

#### **5.2.4 Content analysis**

In conventional terms, content analysis employs empirical and statistical methods to deal with textual materials. Content analysis is specially used to divide the text into units of meaning in the form of quantification of these units in terms of certain rules (Lincoln & Guba, 1985). Holsti (1978) modifies Berelson's early definition of content analysis (1970) by emphasising quantitative descriptions of the manifest text. He defines it as objective, systematic, and general descriptions of the manifest content of a text. Being objective and systematic means that every stage in the process of the analysis must be based on explicitly justifiable formulated rules and procedures (Lincoln & Guba, 1985). Although the content analysis employed in the main study was drawn on Holsti's definitions in principle, it took account of all the demonstrative and explanatory elements comprising the children's work, particularly those relevant to the aspects emerging from interviews and observations. Objective evidence gained through content analysis sufficiently consolidated the data from the interviews and observations.

### **5.3 Procedures of the fieldwork**

This section is divided into three parts: the general setting, the sample, and the phases of the fieldwork.

#### **5.3.1 The general setting**

Access to the sampled schools was initially granted by the principals and the headteachers. However, there were two main purposes of subsequent discussions and negotiation with the teachers prior to the start of school. One was to elaborate teachers' understanding of the main concern, procedures and their anticipated participation in the fieldwork. The other was to set up the time schedules of fieldwork in each class, in ways which would fit into the predetermined syllabus. Meanwhile, as the teachers suggested in the pilot study, the researcher proposed

that she should be introduced to the children as a university student, and the teachers all agreed on it. It was shown that, by and large, the teachers and children, alike, took little notice of the researcher's presence within about two weeks. Figure 5.1 provides an outline of research methods and data acquired during the main study.

Data on	Methods employed
life histories and established characteristics of the children  children entering school in general and performance on tasks in particular	notes on the interviews with the parents and transcripts of the teachers' interviews
the task-related instructional activities, actions and immediate contexts in which the teachers and the children worked through the tasks	fieldnote observations
the teacher's perceptions, emphases, understanding, requirements and interpretations concerned with their instruction about the tasks, the task elements and children's work	tape-recorded interviewing of the teachers
children's actions, approaches, strategies, and the outcomes	fieldnote observations
children's knowledge states, skills and understanding necessary for performing the tasks	notes on the interviews with the children
the nature and demands of the tasks  the characteristics of the work outcomes of children	content analysis of the children's workbooks

*Figure 5.1 The outline of research methods and the data obtained*

### 5.3.2 The sample

#### *The sample of the settings*

It was clearly indicated in the pilot study that children of the two varying catchment areas had notably different learning experiences. The eastern-central area of Taipei is the most prosperous, while the western-suburban area is the least prosperous. In attempting to have useful insights into the effects of environment and family background, it was necessary to examine the school performance of children from these two areas. Having visited eight primary schools located in these two areas, two were chosen in terms of the willingness and cooperation of the principals and headteachers. The central-catchment primary school comprised twenty reception classes while the suburban one had sixteen.

#### *The sample of the teachers*

It was suggested to the headteachers in deciding which teachers should take part in the fieldwork, that it would be helpful to have a clear contrast among the sample in terms of teachers' ideas about teaching and classroom management. Having taken these suggestions into account, the headteachers then selected a sample of teachers according to the teachers' willingness to take part in the fieldwork. As recommended by the headteachers, two reception teachers in each school who were the most willing were invited to take part in four months of fieldwork. It was then decided to sort out the crucial features relating teachers' instructions to the tasks during the first phase of the fieldwork. This procedural strategy was congruent with the suggestion in the literature that qualitative data should be primarily grounded in the field and salient issues should be allowed to emerge in the course of the field study.

The four teachers who were selected, in the event, did not vary much in terms of experience. They were widely recognised as experienced and capable as far as professional teaching were concerned. The teachers in the suburban primary school - Mrs O and Mrs R - were both in their early to middle thirties and had been teaching for ten and twelve years respectively. The teachers in the central primary school - Mrs S and Mrs U - were in their late thirties and late forties and had been teaching for fifteen and twenty-five years respectively. The teachers' substantial teaching experience had advantage that the fieldwork was not affected by adverse

complications and distractions during lessons due to teachers' inexperience in dealing with classroom discipline. Figure 5.2 outlines background information of the sampled teachers.

Teacher	Age	Area	Class size	Years of experience	Time schedules for the fieldwork	
Mrs O	32	western suburban	45	10	Tues. Chinese	Fri. Maths.
Mrs R	34	western suburban	46	12	Tues. Maths	Fri. Chinese
Mrs U	47	eastern central	49	25	Wed. Maths	Sat. Chinese
Mrs S	38	eastern central	44	15	Wed. Chinese	Sat. Maths.

*Figure 5.2 An outline of background information of the sample of the teachers*

#### *The sample of the children*

Following the findings of the pilot study that many children had difficulties in getting on with school work, the main study was intended to explore the causes of the difficulties encountered by the children. Therefore, the majority of the children involved in the main study were sampled from those lagging well behind and the minority from those forging ahead. Two tasks were taken to sample the target children. Firstly, each teacher selected four or five children who were performing very well and ten children were performing badly. This was based on children's responses to classroom instruction of the first two weeks in general and their performance on a various kind of school work in particular. More specifically, teachers' selection of the target children was quantitative in the sense that their judgments were mainly based on the approximation of the frequency and amount of errors embodied in the children's work.

Having been given the brief, general but vague reasons for the list of sampled children, the researcher obtained additional evidence of qualitative differences in the outcome variables involved in the work of these children. Consequently, three criteria were used to sort out the poorly-performing target children: inconsistency, lack of comprehension, and the frequency of errors, problems, and difficulties displayed in the work outcomes. As far as the comparison group of pupils progressing well was concerned, the criteria were set to be the versatility and adequacy of their actions on the tasks. The children making good progress in the main served to stress the importance and the significance of particular individual

characteristics. Subsequent discussions with the teachers about the researcher's selection led to the final identification of the sample of children. It was possible to sample seven children performing badly and two children performing well in each class. In total, there were thirty-six children participating in the fieldwork.

#### *The sample of subject areas of tasks*

As explained in the report of the pilot study, every school-age entrant in Taiwan is required to accomplish various kinds of school work taking the form of the subject-specific workbook tasks or the teachers' own assignments. It was found, throughout the pilot study, that the workbook tasks in four academic subjects were the main stream of learning experiences for the children. However, it would be extremely difficult and unrealistic to cover all tasks across four academic subjects in depth in this fieldwork. When comparing the time and effort needed to complete the tasks, those involved in the subjects of Chinese and mathematics stood out as the natural choice for further analysis. There were two advantages in focusing the fieldwork on the children performing language and mathematics tasks. First, it was apparent that the tasks in these two subjects were similarly designed, in a more distinctively structured fashion, than those in other two. Comparing the similarities in this respect led to delimitations of conceptual categories representing the relationship between the structure of the tasks, children's performance, and teachers' instructions. Second, the differences in task demands for domain-specific knowledge and skills of these two subjects opened up a primary and vital access to understanding the effects of the subject matter on the task performance of the children.

#### *The sample of the sessions*

The main concern of the study meant that fieldwork should begin at the start of the academic year. Discussions and negotiations with the teachers brought the researcher the opportunities to plan out the timetables for carrying out subject-specific fieldwork in four classrooms on the basis of the regulated syllabus. It was decided that fieldwork was conducted in the first semester, while the last two weeks of the semester were left to the teachers to develop and administer informal examinations aimed at assessing their pupils' learning outcomes. In total, fieldwork lasted for four months. The researcher made use of the last two weeks to review the

data acquired, in order to ensure that everything had been covered before concluding the fieldwork.

As proposed and scheduled, the teachers and the children in each class took part in fieldwork in four periods of subject-teaching two school days a week. It was decided that subject-specific fieldwork would proceed on alternate days. In the class of Mrs O, for example, language-specific fieldwork was on Tuesday, whereas mathematics-specific work was on Friday. In the class of Mrs R, in the same school as Mrs O, mathematics-specific fieldwork was done on Tuesday, while language-specific was on Friday. It was intended to undertake fieldwork in two reception classes of the same school on the same school day for logistical reasons and in order to work with the children as much and as often as possible.

### 5.3.3 The phases and stages of fieldwork

In the main study, there were two phases in the fieldwork. The aim of phase one was five-fold: (1) collecting background information on the school, the teachers, the children, the parents, and the classroom practices; (2) sorting out the important aspects of the relationship between the teacher's instructions and the tasks; (3) identifying crucial differences in children's performance on school work in order to select the children to take part in the second phase of the fieldwork, (4) giving teachers and children alike the opportunity to get accustomed to the researcher's attendance and fieldwork; and (5) refining and mastering the research skills and procedures necessary for collecting the data subsequently.

Phase one lasted for three weeks. Both the teachers and the children were seen to be accustomed to the researcher and the fieldwork by then. It was really encouraging to hear "I forgot about you being in this class. I have already regarded you as a pupil of mine." It was clear that the children by and large were not interested in and did not pay attention to the researcher until the target children were invited to take their part in fieldwork. The findings of the second phase of the fieldwork constituted most of the results of the main study. In each reception class, fieldwork was carried out during each scheduled day along the following stages:

1. a brief pre-task talk with the teachers to ascertain their task-related intention, focal points, and understanding;

2. a chat with the target children due in the scheduled session of fieldwork in order to establish necessary rapport;
3. observations of teachers' instruction, children's responses to teachers' instructions, and the immediate context in which instructive interactions occurred;
4. observations of children's performance on the tasks;
5. post-task interviews with the children to have their explanations of their thinking and acting upon the tasks; and
6. post-task interviews with the teachers to gain their explanations and interpretations of their own actions, children's performance and outcomes and the tasks in their own right.

Fieldwork came to an end with encouraging remarks of the teachers, for example,

It has been a special pleasure to take part in such a research project whose results are worthwhile and useful for professional practitioners like me in particular. Four months of unprecedented encounters with you and the fieldwork have been one of the most illuminating experiences in my career.

The task of the researcher, then, was to justify this confidence by extracting from a complex and unwieldy data set, conceptual categories and relationships which would illuminate the general area of starting school in Taiwan, and suggesting reasons for the difficulties experienced by many of the pupils in their school work.

#### **5.4 The procedure for analysing the data obtained**

In Chapter 3, the general principles used in analysing qualitative data were introduced. These principles guided the approach used in analysing the data collected in the main study, but they had to be adapted to fit the particular focus of data involved here. The specific procedures used are now described.

Having thoroughly read the interview transcripts and notes, observation fieldnotes, and analytic descriptions of children's work several times, three criteria were set up for sorting out the data which illustrated children's difficulties in starting school: the

frequency of occurrence, the extent and scope of interrelationships, and the emphasis given by the respondents. There were two general tasks undertaken to process the enormous quantity of field data. First, it was necessary to identify within the raw data the smallest pieces of meaningful information, that were the units to be used for subsequent descriptions. This kind of 'unitised' information was put on index cards, which took the form of phrases or single sentences. Second, to draw contextual information relevant to the unitised information from all available data sources together. This kind of descriptive information was put on source cards which contained the properties, the relations to the others, interpretations, comments, implications, and background information about the informants. Although the information was drawn from different sources - interviews, observations, and content analysis - they were delimited within the same reference framework which provided rules for classifying information into conceptual categories. But, to identify the sources of data on sight, source cards were colour coded. Interview data were put in red, observation data were put in black, and content analysis of children's work was put in blue. In practice, five specific procedures were undertaken to process the data and to delimit the conceptual constructs.

Stage 1, the units of meaningful information were placed on index cards; phrases and single sentences were put to represent the properties of the information at the basic level. Also, an entire set of source cards was coded for (1) the type of respondents or instances from whom or which each unit was drawn, (2) the time when the target source occurred, (3) the site from which each unit was collected, (4) the episode during which each unit was collected, (5) the example used to represent the nature of information, and (6) organisational resources to which the unit of information was related.

Stage 2, source cards were classified into groups which represented conceptual constructs in terms of the reference framework for categories, which had been drawn from the previous literature. At this stage, eight specific tasks were taken. Firstly, cards were divided into the more and least relevant groups. Secondly, the more relevant cards were placed in provisional and unnamed categories according to similarities in the properties of factors which represented the relationships among units of meaningful information. After approximately 90 or 100 cards were placed in categories, new categories gradually emerged. Thirdly, the properties of



each category that had reached a critical size were identified. The commonalities of properties were then elaborated to serve as provisional rules for inclusion. Fourthly, after referring to the previous literature, categories were named and their definite rules for inclusion were developed. Fifthly, cards already placed in the newly named categories were reviewed in terms of the provisional rules and names of categories. If this review led to conflicts or ambiguities, there would be a revision of units, provisional rules, or the names of categories. Sixthly, cards were continuously placed in categories and categories were reviewed for overlap at the same time. Seventhly, categories were examined for identification of possible relationships between them. Finally, the less irrelevant cards left behind after stage 1, and incomplete or missing categories, were reviewed for their possible relevance.

Stage 3, categories delimited from three data sources - interview, observation, and content analysis - respectively, were brought together to sort out more definite, relevant, and complete properties of important factors (units of meaningful information) subsumed under the same categories. Then, these conceptual categories were put on another set of bigger cards which was coded for the same issues derived from different sources. The relationships between these factors were also identified. At this stage, the main purpose was to elaborate, corroborate, and complement the properties of integrated factors in a category by relating to the units of information sharing the same meanings derived from different data sources.

Stage 4, units, properties, factors, provisional rules, and the names of categories were all checked again. The categories which were ultimately delimited were looked at in ways in which logical sequences could be identified. Overlapping categories were integrated and logically-insufficient categories were removed. The relationships between the categories were then identified as the evolving "theoretical framework" to guide further analysis. There were four criteria set for a closure of the delimitation of categories. Firstly, the units of information had been exhausted. Secondly, the categories had become saturated, despite slight modifications made to classify meanings or rules. Thirdly, a sense of integration or regularity had emerged. Finally, new information no longer related to the established categories.

Stage 5, the participants - the teachers and parents - were invited to give their opinions of the reconstructions of the field data made by the researcher, which in

the main took the form of categories. Their viewpoints were given serious consideration in deciding whether those reconstructions were authentic and reasonable representations of the reality experienced by the respondents. A further check for deciding whether the categories made sense to practitioners was carried out by a discussion on the reconstructions and the background of the research project with the school Principals.

All the delimited categories will be presented in Chapters 6, 7, and 8 and their relationships will be illustrated in Chapter 9. The effectiveness of the measures used for processing the data and delimiting the categories will be reviewed and discussed in the final chapter.

## CHAPTER 6

### Qualities of School-age Children

#### 6.1 Introduction

This chapter begins the analysis of the data. Here we shall be looking at what parents and teachers said both about the experiences of entering the reception class and about the qualities in children which affect the progress they make. The data to be analysed were the transcripts of interviews with 36 parents of 28 children who were having difficulties and 8 children who were doing particularly well. Central to the analysis of these data was the delimitation of conceptual categories. This was done by comparing differences and similarities between instances which might help to explain why some children were progressing well while others were doing badly at school. The coding categories developed in the study were the theoretical abstractions which represented a condensation of instances having elements in common, potentially related to the performance of school-age children in Primary 1. In practice, the codings were specially built on significant and crucial instances which might explain why the children performed as they did with the tasks. In addition, there was another vital task in developing the coding systems, i.e. establishing a framework for categorising elements which shared similar properties and meanings with some other elements while excluding others.

In this chapter, there were four main sources used to guide the forming of categories. These theoretical ideas were used to make sense of the comments of the parents and teachers, although this chapter is focused not on the existing psychological evidence on children's development, but on what parents and teachers *believed* to be important in the specific context of Taiwanese reception classes. Here, we are establishing, as much, the ways in which parents and teachers explain the difficulties experienced in reception classes, as what the origins of those difficulties really are. Their comments reflect their attitudes, not the realities. The first source was drawn from theoretical constructions in child psychology in general (Bee, 1985; Hilgard et al., 1971; Kagan, 1984; Lindgren et al., 1975; Mussen, 1983; Piaget & Inhelder, 1969; Watson & Lindgren, 1973). The second involved concepts from educational psychology which describe teaching and learning in practice, e.g. those formulated by Ausubel (1959, 1968), Ausubel et al. (1980), Blair et

al. (1975), Bloom (1976), Cronbach (1977), and Wittrock (1986). In addition, with special reference to early childhood development and education, there was the work of Donaldson (1978, 1985). The third was drawn from the conceptual and organisational models of academic learning and academic work formulated by Doyle (1977, 1979, 1983), Brown et al. (1983), Blumenfeld et al. (1987), and Reeve (1987). Finally, there were reviews and studies with special reference to infant school and reception class (Barrett, 1986, Cleave et al. 1981; Davis, 1988; Desforges, 1990; King, 1978; Moore & Moore, 1975, Willes, 1983), and school readiness (Renwick, 1984).

This chapter presents the views of the parents and teachers on the qualities children brought into reception classes. The following presentation falls into two parts. The first sketches out a picture of what parents and teachers perceived beginning school was like, while the second examines the qualities they considered to be important in affecting the school performance of children. But first, there are some points to note, before presenting the findings.

Although the main focus of the interviews with the parents and teachers was consistent in general, there were inevitable differences of emphasis between these two groups. It was mainly because they had contrasting experience and responsibility for children's development in its different aspects. Of course, parents knew a great deal about their children that the teachers could not know, and there were many other things which were not obvious to the teachers as the children started school. Conversely, the teachers were far better informed about aspects of children's schooling. The value of bringing the views of the two groups together was the complementary understanding and cross-linked explanations which provided illuminating and practical insights into the qualities required of the children in starting formal schooling.

## 6.2 Starting school

All the parents were very impressed by the fact that starting school meant so much to their children - long before the academic year commenced. It was stressed that the first day of school was the greatest moment in the children's lives and was symbolised as a concrete landmark of growing-up. The parents shared the children's joyful expectation, unbearable excitement, and hidden anxiety. However,

they revealed that the children's over-optimistic expectations about going to school were soon overshadowed by the impersonal reality of school. This was the result of being bound by strict rules, necessary for engagement in the mainstream of school routine. Most of the parents reported that their children disliked, or were afraid to go to school, soon after starting, regardless of the level of performance and the rate of progress.

Shin, my third child, had been eagerly waiting to grow 'big' enough to go to school like his brother and sister. On the day before the great day came, he went to bed with tremendous excitement and little anxiety. He woke up for school far earlier than usual next morning, the first of September, and proudly walked with me with a cheerful smile on his way to school. It came as a shock to me, when he begged to stay at home at the end of the first week. He complained that school was a 'fierce' place in which he rushed to many activities all of the time. He has been quite anxious about going to school since then. (parent from central-area home, child with a high level of performance)

A few days after school started, my son became reluctant to leave for school. He said he hated to do the *boring* things he was told to do by the teacher. It seemed to him that going to school was not the pleasure he had imagined before starting school. (suburban, high)

This sudden change from positive to negative feelings about school came as an incomprehensible shock to the parents. However, a few parents said that their children always enjoyed school in their own terms. They liked the social encounters, especially games, with their peers which they did not have at home.

My child has been really looking forward to going to school ever since the first day at school. Although he is at the bottom of the class now, he is still eager to leave for school in the morning. I gather that he enjoys being in school because he has many friends to play with. He often talks about funny things in school. He never seems to bother about punishments which deter him from being too playful to complete school work. (suburban, low)

Most of the parents pointed to the particular contextual demands of school which caused panic to both children and family.

During the three-month holiday prior to starting school, my son got into the habit of sleeping in and getting up late. Life was free. He found it difficult to adapt to regular and formal school life. He was very upset when he was wakened early enough to be in school for 7:30 a.m. But he always exploded with rage when he was late for school. We simply did

not know how to help him adjust to this big change in the routine of life at that time. He frequently cried because of the delays in my making things ready for him. He was very slow at getting washed and dressed. Then he had no time for breakfast before going to school. (central, low)

I have been like an on-call doctor since my son began school. I have to be ready for his panic phonecalls from school asking me to bring him the books and the equipment necessary for lessons. He frequently leaves them at home. He is supposed to organise his schoolbag according to the syllabus copied from the teacher and the teacher's special messages about the next-day's lessons. The problem is that he neither reads the syllabus nor can he recall things especially mentioned by the teacher. Above all, he has not learned to take preparation for the lesson seriously. (central, low)

My daughter has to go earlier than others so she can complete morning work assigned by her teacher during the self-study session. She also has to spend a couple of hours finishing homework which is written work for the most part. It is mainly because she is inexperienced at using a pencil intensively and continuously to write words. We could not help her, although we thought the work seemed too much for her to do at that time. (suburban, low)

My dialect-speaking daughter has felt very bad since starting school. She was unable to understand what the teacher said in Mandarin. I watched her gradually lose her enthusiasm, interest and desire to go to school after that. She said that her teacher spoke so fast and used such long sentences that she could not catch what had been said during instructional sessions. She frequently asked me about meanings of unknown words and usages her teacher uttered. She was quite depressed about it. (suburban, low)

It was obvious that the parents were mainly aware of the change caused by the immediate demands facing their children at the start of school. These demands were the routines of school life, school work and instructional modes. In contrast, the teachers all paid more attention to the new pupils' customary behaviour and attitudes. It was specifically indicated that a great deal of initial effort was made to help the children grow out of these unfavourable attitudes, behaviour and manners by drilling them in what was required.

A number of entrants were very untidy and poorly organised when they came to school. Their bags were overloaded with everything they brought to school. They were neither used to, nor learned to, keep their drawers, tables and schoolbags tidy. Most of their time was wasted in looking for things. (Mrs O)

Many entrants used to lie with their faces downwards on the desks so frequently that I had to stop ongoing instructions to remind them to sit upright. I cannot understand how they can concentrate on lesson activity and school work when they do not get their posture right. (Mrs U)

In the reception class at the beginning of school, some children talked loudly, stood up and walked around the class as they pleased. They disturbed not only me but also the whole class. Also, quite a number played with toys and stationery underneath drawers, looked through windows, ate snacks and asked to go to the toilet during lesson, as if they were still in the kindergarten. Most of them had been in laissez-faire kindergartens for two or three years during which they had got into the habit of doing things and behaving as they wished. More importantly, most of them were too impatient and self-centred to cope with group life and to learn the matter they had been taught in kindergarten in the more accurate and proper way. (Mrs S)

Of my pupils, four or five were really mature or even adult-like compared to the others. They disciplined themselves so well that I could afford to take my eyes off them. They responded to requests in the instructed way, when the time and the situation permitted. They could sit still and pay attention to the lesson however long it was. They also kept working for long periods of time. (Mrs R)

As the teachers explained, the children also confronted immediately the demands of recognising and producing their own names in Chinese characters.

In particular a number of the entrants in this suburban area could neither recognise nor write their own names when starting school. Since then they have had difficulties in engaging in routine activity. For example, they failed to get their own books from cupboards to do the work, nor were they aware of taking others'. Their names, two or three characters, have been so important and familiar to them that they should have mastered them at any rate. If they cannot even write their names, what else can they do? This skill is very useful and necessary for engagement in school activity. (Mrs U)

It was explained in the interviews that the children had to come to terms with the fact that they were labelled by numbers. The teachers pointed out that these numbers were used on the occasions in which the results of activity were put as school records, for example, physical examinations, written examinations, and routine programmes. They emphasised that they mostly did things with the children in the classroom by numbers for the convenience.

Entrants are labelled by number according to their birth-date. They have to learn to queue by numbers to take part in many routine activities such as physical examinations in the initial phase of school. Many of my pupils neither remembered their numbers nor were they able to queue by numbers. If they did not know where to stand in a queue in such a large class, and they had not learned who the others were and their names, they began to panic whenever collective activity took place. A few queued in the right positions because they attempted to recognise those in the front and behind them. Although I stressed this key point to those who always got lost in the queue, some still failed to be in their positions. I had to take them to be where they should be, eventually.  
(Mrs O)

As we have seen, starting school meant that entrants had to involve themselves in predetermined programmes and routine practice and meet demands inherent in them, which the school valued and supported. It was obvious that the children had to learn to be school pupils on their own without any supportive or gradual arrangement, during the transition process, to help them overcome the problems of facing big changes in many aspects of life. Clearly, as the parents and the teachers pointed out in one way or another, for many children, starting school appeared to be generally unsatisfactory experience. Yet even in these initial general comments, it becomes clear that children's reactions were very different. These reactions depended on their previous experience in kindergarten, but also on their own personal characteristics and qualities.

### **6.3 Qualities of children**

The combination of the points of view of the teachers and the parents, expressed in the interviews, indicated five categories of children's qualities related to school performance and progress: cognitive ability, facility in language, approaches to work, socio-psychological states, and physical attributes.

#### **6.3.1 Cognitive ability**

As far as the children's cognitive abilities were concerned, six factors were described as affecting the children's learning outcomes and task performance, i.e. the ability to learn and think, academic cognition, prior knowledge and skills, perceptual discrimination, attention, and memory.



### *The ability to learn and think*

The ability to learn and think - intelligence as some called it - was given foremost attention by the parents in suburban areas, more than others, throughout the interview sessions.

I cannot help making a joke that my daughter does not have a brain to learn and think. She is bound to think in order to learn at school, isn't she? It seems to me that she does not stop to think nor does she know what and how to start thinking. I gather nothing happens to her mind, whatever the teacher says and does. (suburban, low)

I have to admit that my son learns things generally extremely slowly, and school matters in particular. We have to demonstrate basic concepts in detail and help him get through repeatedly. He now still fails to recognise numbers and words that he learned for three years in the kindergarten. (suburban, low)

Although a similar recognition held by the teachers confirmed a belief in the foremost role of intelligence in school performance of the children, it was seen as a composite of abilities needed to meet specific demands inherent in the programmes and the lesson activity.

I agree that intelligence plays an important role in children's schooling as a whole. To the best of my knowledge, the children performing badly did not possess the abilities which enable them to work through the learning tasks undertaken in the lesson activity. Throughout the existing reception education, in practice, as you have seen, the children are required to manipulate symbols, to generate the principles which govern different kinds of facts, to grasp relational concepts, and to think inductively. More significantly, the children performing badly did not possess these abilities in the past nor can they develop them sufficiently and quickly. Those who progress very well obviously have developed these abilities before starting school, or at least have the capacity to develop them over a period of time. (Mrs U)

The children who make rapid progress can be picked out for their special abilities. They recognise the relationship between factual knowledge (know what it is) and procedural knowledge (know how to do and why it is so). More importantly, they can generalise and apply what they know already to the relevant context, think over inductively those components involved, and construct meanings out of the context provided. These abilities certainly are not necessary for the minor subjects such as handcraft and music. They are prerequisites for academic learning and tasks which, for the most part, constitute the children's experience of school. (Mrs O)

It was clear that the learning programmes and lesson activity required the children to be equipped with certain abilities. The above extracts had implied that these special abilities narrowed a wide range of learning experience to a composite of encounters with those demanding intellectual capacities for specific to academic matters.

### *Academic cognition*

Many parents whose children did very poorly were perplexed by a distinctive phenomenon that their children could learn things in everyday life very quickly and easily but failed to do so at school. Such a phenomenon was particularly stressed in the suburban cases. For example, some parents in these areas found that their children were competent and skilful at doing household chores and helping with the family business, even though they had not been intentionally taught. However, the teachers explained that this kind of child possessed capacities which were not operated in the same way academic matter was formulated. Instead, these children's everyday abilities were described as taking the form of knowledge and skills which were spontaneous, incidental, intuitive, individual-specific and loosely-structured.

There are always a few pupils who can deal with daily routine very well, without being deliberately taught. For instance, two or three pupils who are poor at reading can help collect and distribute workbooks and learning aids to the whole class, making no mistakes despite being unable to read the names of pupils in Chinese characters. They also can stamp names on books of the whole class efficiently. I assume that this kind of ability essentially enables the children to have particular insight into everyday events, objects and phenomena. (Mrs R)

The everyday abilities, to the best of my knowledge, involve the children's own purpose, concerns, and interest. They are operated in a rather spontaneous, intuitive and incident-specific orientation. However, this kind of child still fails to acquire knowledge and skills during the lesson sessions. It is mainly because academic learning and achievements, which dominate the children's learning experience, demand of the children different cognitive capacities and orientations, i.e. inductive and deductive reasoning, disciplined procedures of actual operations, intensive efforts, prolonged engagement, and precise standards of outcome. These children are not aware of the difference in the demands between these two kinds of cognition. Neither do they have the abilities to grasp academic matters. (Mrs U)

The aspect of academic cognition obviously appeared to be beyond the parents' reach. The teachers took it as explaining the children's special failure to learn things and make progress at school. It meant that the children's everyday knowledge and skills could not guarantee the mastery of academic learning and achievements.

*Prior knowledge and skills*

Prior knowledge was recognised in the interviews as particularly important in going about learning and performing new programmes. All the teachers were well aware of the fact that their pupils brought to school prior knowledge and skills. They stressed the importance of its relevance to the demands of the reception class curriculum. The teachers in the central area emphasised that the children benefited a great deal from a wide range of general knowledge and experience, literary knowledge and experience, and learning strategies, acquired before the start of school.

The children who possessed a large body of life experiences, common sense, and language knowledge, before starting school, learn and progress better and faster and more easily than others. Whereas poor-quality learning experience in kindergarten hampers the children from accurately and properly learning and performing the tasks in the same domains at school. (Mrs S)

The children who had already learned the subject matter of Primary 1 in kindergartens are not interested in listening to the lessons at all. It is mainly because they are fully convinced that they already know what is being taught and what is required to be done. This is a very unfavourable consequence resulting from preparatory education for Primary 1 material encountered by the children in kindergarten. (Mrs U)

In contrast, the teachers in the suburban area suggested that the children should have certain experience of Primary 1 programmes before the start of school. They explained that similar learning experiences enabled the children to make sense of demands imposed upon them all at one time, where situations did not allow for their gradual familiarity with demands which seemed to be very difficult and unfamiliar at first. It was suggested that the children should be familiar with the symbolic representations, such as phonetic symbols and numbers. The teachers emphasised that even superficial recognition of these symbols could help the children, who had intellectual and language disadvantages, to avoid unnecessary

shocks, frustration, and difficulties, to some extent, in the initial phase. The parents in the suburban area revealed an enigma that their children, who had learned the same domain of knowledge and skills in kindergartens prior to the start of school, still found it difficult to work through the language programmes they were facing in school. The above comments of the teachers in the central area provide an answer to this enigma, that is, the inappropriateness and the inaccuracy of the similar domain-specific experience acquired in most kindergartens.

### *Perceptual discrimination*

Distinguishing information perceptually in accurate ways was described in the interviews as a vital prerequisite to learning programmes and school work. Most of the children who performed poorly were said to fail to make sense of the key points and gain accurate meaning due to misjudgments or confusion of perceptual representations.

Children learn and respond to learning programmes planned and delivered through perceptual representations. But most of the perceptual representations encountered by the children were shapes, numbers, colours, phonemes, syllables, and Chinese characters. Some share certain patterns of geometrical structures or auditory modes in one way or the other. Those who progress very well obviously size up the difference in the perceptual representations between various kinds of information accurately, so that they can achieve real understanding. (Mrs O)

Although the children start learning the fact that different stimuli represent different matters and meanings, they make mistake one for the other because of perceptual confusion and misjudgments. Most of the less able children do not pay attention to, or fail to grasp, the subtle differences among the representations with visual or auditory similarities. Thus, their acquisition is not so accurate as it should be. Without accurate perceptions of the information, they inevitably make many mistakes or get stuck at the perception-dominated ones in particular. (Mrs S)

Certain particular phonemes cause difficulties for the children processing perceptual discrimination, as a result of nearness of vocal functioning. The Chinese characters cause the children's problem of perceptual discrimination at the visual level. Some have the problems of perceiving a pair of numbers such as 6 and 9 in reverse. (Mrs U)

It was suggested that accurate factual knowledge and skills were gained through correctly perceiving the properties of the representations as they were, without distortion. The children's problem of perceptually discriminating representations was seen to vary with the nature and properties of the representations. Nevertheless, the above accounts implied that perceptual discrimination was related to the level of attention paid by the children.

### *Attention*

It was widely claimed in the interviews that the children's poor and slow performance was closely related to their non-commitment to paying full attention to the things which did not appeal to them. The parents specifically suggested that there was a lack of willingness and effort to pay attention to academic subject matter. The teachers empathised with the paradox facing the children. It was explained that reception class children had remarkably short spans of attention on the one hand, while good performance and achievement required deliberate effort to pay full attention to incoming information on the other. Once the children did not pay attention to incoming information, as the teachers stressed, they would not be able to catch up with the ever-moving lesson activity and were at a loss sooner or later. Inattention to school work was described as leading the children to make unnecessary mistakes and bad results.

Almost all children who display poor performance are unwilling to pay attention to the lesson activity and school work even for five minutes. Thus, they do not have sufficient and accurate information resources necessary for good performance. They can concentrate on video games and watch TV shows all day long without interruptions. This proves the span of their attention can be well under control. Children's attention effort should be the case of *Where there is a will, there is a way.* (Mrs R)

However, as long as children come to school to study, they ought to make as much effort as possible constantly to focus on parts of lessons and work as scheduled - however boring and demanding the matter may be. If they miss the key points of instructions, there is no remedial teaching available. Their difficulties are accumulated sooner or later and backwardness becomes a fact that reinforces their unwillingness to make effort to pay attention to all kinds of learning programmes. (Mrs O)

One teacher recognised that children were given so much information simultaneously that there were pervasive, and understandable, difficulties through children's lack of attention to the lesson and to their work.

A few children who make slow progress do their best to concentrate on instructions. However, they can hardly know what, how, and where to fix their focus, as vast amounts of information are presented to them. More significantly, they are able to concentrate on only one piece of information at one time. They simply cannot pay attention to various kinds of information simultaneously. (Mrs S)

The teachers all tended to suggest that efforts to pay attention could be deliberately made by the children, although one teacher, at least, recognised that the teacher could help in this process by reminding them of what they had previously learned, and its meaning.

### *Memory*

One teacher thought memory was of importance to the children in analysing the complexity of the learning tasks introduced. All the teachers stressed that, in order to make sense of the learning tasks, the children must activate what they had acquired from memory and apply it adequately to problem solving. Memory was perceived to be particularly important in Taiwanese reception classes. It was explained that the children learned the subject matter, practised acquired knowledge and skills, and performed the tasks in different sessions, so that a good memory was needed to retain and recall the relevant information accurately over time. A substantial number of the parents in the suburban area were puzzled that their children were unable to remember what had been taught in the class, yet had tremendous memories of personal affairs from years past.

Some parents revealed a fact that their children could clearly and accurately recall something which happened to them a long time ago, for example, the debt their siblings owed them and bed-time stories. However, this kind of child often says to me 'I forgot it!'. It means that they forget the key points of the lessons right away. Certainly, they can't do the work when they have nothing relevant and needed in their mind. (Mrs O)

Most of the children need a longer time to relate the incoming information to the acquisition from their memory in order to make sense of that confronting them in class. The current system does not leave

enough time for these children to bring the information into their own reference framework. Without categorising the information in their own terms, memories are meaningless. For me, poor memories are an excuse for this kind of situational disadvantage in many cases. (Mrs U)

It became clear that the children did possess cognitive abilities which enabled them to process the information given on their own terms. Those who performed badly had intellectual traits and orientations different from those who were favoured by teachers and made good progress in school. The above discussion has already introduced the important role of language ability in school performance. The following section, about facility in language, provides more specific, direct and concrete indications of the children's difficulties in this very important area.

### 6.3.2 Facility in language

The teachers gave three reasons for the fact that language competence warranted more effort and attention of all those concerned, than cognitive abilities, in practice. First, unlike cognitive abilities, facility in language could be deliberately built up by effective language instruction, good quality of language programmes, and a constructive language context. Second, it was seen as a practically powerful tool for compensating the disadvantaged children for the effects of their cognitive deficits, about which school and teachers could do almost nothing. Third, more specifically, the teachers tended to suggest that the children's language facility laid the foundation of reception education, in the light of the fact that most of school work took a language form. It was emphasised that language ability was particularly important in the earliest year of schooling because the children started to learn to read and, at the same time, much of the learning materials, and most tasks, were language based; above all, literacy was the key to the new world in which the children began to be intellectually and linguistically socialised in a formal way.

With respect to facility in language, almost all parents remembered the age when their children began to speak. They all regarded it as the earliest sign of subsequent development and acquisition of children's language in years ahead. It was revealed that two-thirds of children who were doing well started to talk early, while most of those who performed badly began later.

My child started to talk in a comprehensible way at about fifteen months of age. This advancement has obviously provided him with a good deal

of opportunity to learn things in general, and to acquire the knowledge and skills of language in particular, through interactive communications with the older members of the family and other adults. (central, high)

My son was inarticulate until he was four years of age. His backwardness of this kind has deprived him of opportunities to engage in the peer-group play and family conversations. This disadvantage has resulted in a consequent inferiority complex and problems of self-expression. Above all, retarded development of his spoken language seemed to close his mind to incidental knowledge and verbal modes as a whole, prior to the start of school. (suburban, low)

The parents thought that subsequent language acquisition was rooted in the pace at which children developed their ability to speak. Four following facilities evolving from early development of spoken language were said to account for school performance.

#### *Verbal aptitude*

Almost all parents noted that children who made rapid progress had been very keen to recognise new words and to read books. They also pointed to a fact that their children enjoyed conversation a great deal. In contrast, others revealed that their children were not interested in verbal representations at all. Neither could they easily get on with language encounters. This kind of child was described as taking, instead of verbal expression, physical actions as major means of presenting themselves and responding to the situation.

My daughter has been fascinated by new words. More significantly, she always picks up sounds very accurately. She likes to ask about meanings of the words unfamiliar to her. She has enjoyed imitating adults' speech since she started learning to speak. She likes reading so much that she can learn things on her own through reading. Indeed, she gains a wide range of knowledge, and develops many facilities in language, as her interest in reading and literary knowledge grows increasingly strong with time. (suburban, high)

My child always looks as if he has a severe headache when facing language matters. He neither shows interest, nor puts effort into, any activity concerned with language. Whenever he has to deal with language work, he usually turns the book page by page and at the best glances at pictures. He never touches the books we bought for him, or the language books used in school, until he is forced to do so. (central, low)



The teachers also recognised a marked difference in verbal aptitude between the children who performed well or badly. The teachers in the central area particularly highlighted that a strong feeling for language modes led the children to benefit from all kinds of learning programmes at school. In contrast, the teachers in the suburban area specially underlined the pivotal role of verbal aptitude in learning academic subjects and learning to read in particular. It was indicated that verbal aptitude was a critical driving desire, rather than formative force, to access language stimuli. By and large, the parents and teachers alike tended to suggest that there was a relationship between the children's verbal aptitude and school performance. Two factors, within this, were considered to affect children's language acquisition - the command of language and the knowledge and awareness of language.

#### *The command of language*

For the parents whose children did very poorly at school, the limited command of language in their children led to great difficulty in following the lesson activity and making sense of the learning tasks. The parents in the central area specifically attributed their children's difficulties to the difference in the command of language used at school and home.

He frequently gets stuck in making sense out of language expressions and asks me about the words or phrases unfamiliar to him. As you can understand, our family uses the words closely related to routine of everyday life or common events happening at home. This kind of language is incidental, loosely-structured, function-based, context- and self-generated and informal. Those used to represent the domain of knowledge taught in school, are purposive, rigidly-structured, form-based, abstract, formal and teacher-generated. (central, low)

It was described that this kind of child had two major problems in class.

Most of children making poor progress are notably seen to know a restricted number of words. Their resulting problems are shown in two distinct phenomena. One is that they easily lose the key points when they stop to recognise and make sense of those referential words unfamiliar to them, at the same time as a good deal of the language representations move on. The other is that they habitually guess meanings of unknown words on the basis of their small vocabulary. By guessing all the time, they hardly acquire a sufficient command of language. (Mrs O)

### *Knowledge and awareness of language*

For all the teachers, insufficient knowledge of language was accountable for the difficulties encountered by the children processing information in the verbal mode. The teachers in the suburban area specifically emphasised that the children in the area, by and large, did not have the awareness of phonemes, words, compounding phrases, sentences, and of the correspondence between written and spoken language. It was strongly believed that this kind of awareness of language at the basic level was a sufficient condition for learning to read, and for the performance of language tasks in the initial phase of education.

Generally speaking, the children in this suburban area have never been aware of language constructs in their own right. Neither do they know what these language constructs are all about and how they can be used to mean something intended. Neither do they know how syllables, phrases and sentences are formed as meaningful constructs. I do not think they can understand what I am talking about when they treat language as specially separable symbols learned and used only inside school. They forget all they learn in the classroom when they are outside school and they use their own language. They cannot relate their own language to school language in terms of the form, function and application. Without this kind of awareness, knowledge and transfer in the learning of school language across all circumstances, inside and outside school, the children certainly have great difficulty in grasping the meaning of information delivered in the verbal modes unfamiliar to them, throughout lesson sessions. (Mrs O)

As Mrs O suggested, a lack of knowledge and awareness of language was the most important causes of children's failure to construct meaning of discourse, and of text in particular. Clearly, language comprehension played a pivotal role in learning outcomes and performance of the children in most of circumstances.

### *Language comprehension*

It was indicated in the interviews that most of the children who made poor progress did not have the ability to comprehend verbal modes. Their parents emphasised that they tended to pay full attention to surface features of fragmented constructs. They also said that their children understood the whole text or discourse by means of word recognition. The teachers all stressed that the children's comprehension was specially required to process written modes involved in the textbook and workbook. It was specifically indicated that the children in the suburban area failed to gain the meanings of the information, even though they could decode the

linguistic constructs. The teachers explained that understanding the meaning of language constructions as a whole was a matter of grasping the relationship between separable linguistic constructs, related knowledge bases, and the purpose involved. Without real and deep understanding of the meaning of language constructions, as the teachers put it, the children did not have accurate and sufficient information subsumed by the domain of the knowledge and skills which could be kept in their minds over a period of time. The teachers asserted that this kind of child had to learn things by rote and was unable to use high-order knowledge and skills. However, under such circumstances, the children's inability to comprehend the verbal modes were said to be exacerbated by the situational disadvantage which caused a great burden for the children.

I teach pupils analytic processing on the basis of a syllable containing two or three phonemes. But kindergarten teachers taught them in the reverse manner - synthetic processing of constituent phonemes of a syllable. The analytic approach enables the children to look at a syllable as a whole representation. Throughout the lesson activity following this approach, the children learn to look at the relations among the syllables involved in a textual description. Obviously, understanding of the description can be achieved more easily than that through the synthetic approach. There appears to be a notable phenomenon that almost all children who make poor progress depend upon synthetic approach. This leads them to spend far more time recognising fragmented phonemes and syllables on the surface and denying the relationships between these phonemes and syllables. (Mrs U)

Unlike alphabetic languages, however, Chinese is a language system essentially based on meanings of the word. And this intrinsic character can neither be fully integrated into, nor be illustrated, in the phonetic system particularly developed for learning to read in the reception class. Thus, such an incompatibility creates incredible difficulties for the children in gaining holistic understanding of text in phonetic symbols. (Mrs S)

Most of the children have no great difficulty in understanding interactive communications related to daily routine in the class. Children's problems of understanding oral language is partly the result of a lack of command of language specially used in school and the effect of home dialects, in the initial phase in particular. (Mrs O)

It was clear that language comprehension was particularly necessary for learning in the language-dominated reception classroom. Although comprehension ability for

spoken language had not warranted as much attention as that for written language, the teachers had suggested the disadvantage of home language.

### *Home languages*

Two kinds of home language were identified as causing disadvantages to the children learning things generally and acquiring language skills in particular. One was Taiwanese dialects mainly used in suburban areas, and the other was English which was spoken by a central-catchment child who had stayed in the United States for nearly six years and had only lived in Taiwan one month before starting school. It was recognised that prior experience of Mandarin undoubtedly enhanced the children's potential for having a good start in school life. As for the dialect-speaking children, who could learn to communicate in Mandarin within one or two months, the teachers held optimistic attitudes though they doubted that this could improve the level of school performance of these children.

For the children with learning difficulties, those who speak the dialects perform worse than those of the same ability who speak Mandarin, because they hardly understand instruction in Mandarin. (Mrs O)

Of the children who make poor progress, those who do worst come from very disadvantaged families in which the parents cannot speak Mandarin. They do not have any access to Mandarin, except through television. By contrast, those whose parents have a small command of Mandarin can help their children practise Mandarin. This fact makes their children very different indeed. (Mrs R)

In the first two or three weeks, I observed that my pupil of English-speaking Chinese-parents made many incomprehensible mistakes. He looked lost throughout the lessons. His extremely restricted command of Mandarin led him to lag far behind scheduled activities of all kinds. This was a direct result of his inability to make sense out of auditory instructional language in Mandarin. Now he is showing his ability to solve some problems as his Mandarin is improving. As long as he can keep improving his Mandarin, he will undoubtedly catch up with the others. (Mrs U)

It was obvious that language was the main stream of school curriculum and the children's literacy was of great importance in almost all aspects of school performance. Having processed all information given intellectually and linguistically, the children ought to apply those which made more sense to them to

problem solving. Thus, in actualising the children's own understanding through cognitive and linguistic functioning at operational levels, and leading to good results, their approach to school work was said to count a great deal.

### 6.3.3 Approach to work

Since accomplishment of almost all school work was an independent engagement of the children, as the teachers all thought, approach to work affected the likelihood of optimal performance and the quality of the results. The teachers specifically explained that approach to work decided the direction of attention efforts, the orientation of cognitive functioning, and the types of attitudes and behaviour at work. Three aspects were described as illustrating the children's approach to work: organisation of available resources, treatments of the work, and post-work actions.

#### *Organisation of available resources*

Both the parents and teachers pointed to an obvious distinction between the children who made good and poor progress in their ways of making use of working time and resources provided for the completion of work. There appeared to be a consensus that the former group, by and large, were perceived in school and at home to (1) prepare essential materials well; (2) exclude the irrelevant from the relevant; and (3) make sure that things were at hand ready for the start of work. In contrast, the latter group were seen to be poor organisers and mess-makers who crowded unnecessary and necessary things together in the working place.

They are inclined to spend most of class time dealing with irrelevant things. They crowded books, stationery, toys and litter on the tables and in the drawers. As time runs out, they are still looking for their pencils or their books. Instead, they play around or daydream while others are getting on with the learning tasks. The children who make rapid progress spend as much time working on their assignments as those who make slow progress and half as much time in well-organised activities. They tend to be very sensitive to time given to them and they make use of time very well. (Mrs O)

As soon as the children were ready to proceed to actual operations on the work, as the teachers indicated, individual temperament-oriented treatments of school work affected the results.

### *Treatments of school work*

Both the parents and teachers made similar points that the quality of the work to an obvious extent depended upon the ways in which the work was treated. Their views indicated a continuity and constancy of treatments of the work by the children in school and at home.

My child is too lazy to start working. In particular, he simply does not want to make any effort to get involved in any activity or matter which requires his energy and time. (central, low)

My daughter is too shy and passive. Whenever she is puzzled, she stops working and stays quiet rather than asking her teacher for help. I believe that she becomes withdrawn and learn less and less, and does worse and worse, as confusion increases. I gather she must be left behind in the class because of her passive attitudes. If she keeps quiet all the time, her teacher cannot know what kind of difficulty she faces. (central, low)

My son is incredibly perfunctory. He always rushes to complete the work carelessly. Getting the work done, instead of getting it right or doing it neatly, is his only goal. It is no surprise that his work contains many mistakes. (suburban, low)

My daughter is generally very slow. She pays attention to the work in detail. More significantly, she keeps redoing the work until she thinks it is perfect. As a result, she hardly completes the work in time. (suburban, low)

I feel that my child benefits a great deal from curiosity, diligence and initiative. He tries in every available way to achieve the goal to the best of his ability with the help of available resources, including me. (suburban, high)

The teachers' descriptions of the children's work-oriented qualities provided realistic pictures shown in the classroom.

Almost all children who make poor progress are inclined towards being self-indulgent. They neither look at the blackboard nor listen to me as I instruct them. They are not interested in and do not care what happens in the class at all. They spend their time doing non-task activities. (Mrs R)

Some children are too self-assured. They do not want to probe further into more relevant information, once they feel that those involved in school work are the same as the ones they have already worked through. Thus, they tend to make many unnecessary mistakes. (Mrs O)

Many of the less able children make worse progress than they should because they are apt to mind others' business all the time, even when they are working. They come and report what the others are doing, instead of working. This kind of behaviour distracts them from their engagement in the work. Some are very impulsive. They easily explode with rage and give up as soon as they find the work gets difficult. They stop the work then at once. The children who make good progress are sufficiently determined and resolve to get the tasks completed. (Mrs U)

The children who performed well were described as treating the tasks in the following manner in general: (1) engaging in work immediately; (2) being able to pay attention to the requirement for task performance; (3) asking the teachers for further explanations about any points confusing them; and (4) keeping doing the work until it was completed. The children who performed badly were described as approaching the work in a different manner.

Some of <sup>the</sup> backward children hardly start the work without being continuously reminded to get on with it. It is most unlikely that they will complete the work unless they are threatened with punishment. (Mrs U)

They have got into the habit of talking and making fun of each other when they are starting to work. Indeed, they do not attempt to solve the problem on their own. They either copy answers from others or wait to have it corrected. (Mrs S)

A few do the work without thinking. They just fill in all the blank spaces. They do not try to figure out what those tasks are really about at all. (Mrs O)

It was apparent that the children who performed badly did not make any effort to do the work to the best of their abilities. Compared with those who made good progress, these children had inappropriate work-oriented actions and manner which distracted their main concern and necessary commitment from the work. It was said that the children's actions upon the completed work affected the extent to which learning outcomes, and the quality of the results, could be improved.

### *Post-work actions*

Almost all parents in the suburban area, and some in the central area, commented on the fact that their children did not review the results of their work. This fact was said to leave unnecessary mistakes made by the children unexamined.

He goes out to play as soon as he thinks he has got the work done. He never bothers with thinking about what he has done. Sometimes I find that he can solve simple problems when I ask him to examine his answers - though he got them wrong when he did them first of all. (central, low)

The teachers noted that the children who were doing well went over their work carefully whereas the children doing badly put the work aside as soon as they could get through it or the teacher called a break.

As a matter of fact, some of the work I ask the children to do is not actually difficult. To get good results the children have to be responsible and think about what they are doing all the time. (Mrs R)

Some children always give up half way through while others do not care if it is right or even consider the quality. They produce very poor work. To be honest, they could do better. They just do not care about the work at all. (Mrs O)

Inappropriate approaches to work, described above, appeared to stop the disadvantaged children from reaching their optimal performance. But these approaches had their origins in more general problems - their awareness of the pupil role, their motivation, and their developing self-confidence.

#### 6.3.4 Socio-psychological states

For the parents and teachers alike, three factors related to socio-psychological states provided the children with a general basis of their interaction with the teachers and learning tasks, i.e. recognition of the role as school pupil, self-confidence, and their motivation to learn.

##### *Recognition of their role as school pupil*

Most parents said that their children were very pleased to be called school pupils, although they did not take the demands for school pupils seriously. Some of the



children who were doing badly were described as being unable to distinguish between being children at home, or at kindergarten, and being pupils at school. They were said to lack recognition and fulfillment of responsibility for engagement in the learning activity and accomplishment of the tasks. In contrast, the children who made good progress were perceived to detach themselves fairly well from the roles played outside school.

My child still behaves like a little spoilt baby. His teacher describes him as too self-indulgent, impulsive and careless. More importantly, he is almost entirely dependent on me. Whatever he wants to do, I have to prepare everything for him. Otherwise, he will become emotionally disturbed. I have to sit beside him when he is doing his work from the beginning to the end. Occasionally, he cries, asking me to do the difficult part of work for him. I am quite certain that he must depend on his teacher at school as he does on me. But he cannot have the teacher's full attention, as he can have mine. His over-reliance on others certainly deprives him of opportunities to take active part in learning. I believe that he lags behind due to the likelihood that he waits for the teacher's further explanations or help, without trying things on his own in the first place. (central, low)

In the first few weeks, my son begged to go back to the kindergarten. He explained there was more time to play there and there was a snack. More significantly, he could do as he wished. This is very likely to be the reason why he still plays in reception class when he wants to. (central, low)

The teachers stressed the importance of the recognition of the role as school pupil. They laid respective emphases on the aspects which were recognised, valued, and actualised, by those who made rapid progress.

School children should respect the authority of the teacher and in particular obey the teacher in all aspects. Of the children who make poor progress, some never care what is required by the teacher. Therefore, they get out of touch and eventually lag far behind. (Mrs U)

For example, school pupils ought to be in school on time, finish their school work to the best of their abilities, practise what they have learned regularly, prepare the things for the class every day, follow norms of the class, and ask for the teacher's help if they do not understand. (Mrs S)

A few children who do very poorly behave as if they are specially privileged to do things whatever and whenever they want. More significantly, they don't think they should take the learning tasks

seriously and do things as told. The accumulated ignorance and irresponsibility on their part lead them to be out of touch. They then develop negative attitudes towards school, which hamper them from making an effort to learn things and perform the tasks. The children who make good progress realise what 'model' pupils are like and attempt to be so. They remember what the teacher wants and stick to it. Some of children who make slow progress never seem to care what types of pupil they are in the teacher's eyes. A few seem to have no conception of 'should and should not, right or wrong' so that they do things at will. (Mrs R)

Clearly, the recognition of the role as a school pupil involved expectations and demands for discipline and responsibility for taking part in classroom activity. Without this kind of the recognition of the new role, the children would be easily distracted from the main concern by their own interest.

#### *Confidence and self-esteem*

As almost all parents described in the interviews, children felt themselves relatively confident prospective entrants prior to the start of school. Nevertheless, the great difficulties facing the children were said to destroy the confidence of the children whose abilities were incompatible with school demands. The teachers in the suburban area particularly stressed the profound effects of the loss of confidence in the ability to learn things and to do the work. It was pointed out that this kind of loss was increasingly severe as the subject matter got more difficult and led to the loss of self-esteem. The children were described as having low opinions of themselves. More specifically, as the teachers explained, they hardly believed that they could achieve anything in any form, however hard they tried.

Some of the less able children recognise that desired achievement is like a 'fairy-tale' that can never be realised. Their hard work and small relative improvement does not merit recognition and there is no encouragement. They learn that they can never be 'good pupils' in the teacher's eyes, if they have to master learning all things and to achieve high standards in order to be so. (Mrs R)

It happens that, sooner or later, many children lagging farther behind completely lose confidence. They perceive themselves as 'failures' as some teachers and parents call them, even in public. They feel they are worthless. They give themselves an idea that they cannot do anything good, more significantly, they are not in charge of themselves. Some of them fear failure, which causes great anxiety for them. All these things deter these children from involving themselves actively in the learning tasks. This becomes an ever-worsening cycle which leads to a

downward spiral in effort, achievement, the trust of their abilities, and the respect for their existence as a whole. At worst, this kind of downward spiral in confidence and self-esteem will profoundly affect these children in many aspects of life for a long time to come. (Mrs O)

#### *Motivation to learning and achievement*

As mentioned above, as the children lost their confidence, motivation to learning and achievement also decreased. The teachers took the view that school performance involved learning, studying, homework, tests, and written examinations, and they were not simply cognitive activities. They particularly emphasised that all the results of these performances were the interaction between cognitive abilities and motivation. Some of the children who did very poorly were said to lose their motivation after they realised they could no longer catch up with the scheduled progress. Boring school matter was thought to make the children unmotivated. Without necessary and sufficient motivation, as the teachers indicated, the children tended to engage in the learning tasks as seldom as they could. In contrast, most of the children forging ahead of the class were described as trying to sustain motivation to learning regardless of disadvantages of the learning tasks and the context as mentioned above. The teachers explained that such children regarded academic achievement as the best credit for personal success which brought concrete incentives and others' high opinions of them. However, without good health and normally developed physical attributes, as one teacher put it, the favourable qualities described above would not be sufficient to guarantee success.

#### **6.3.5 Physical attributes**

As far as demands involved in the learning tasks were concerned, four kinds of physical attribute were said to affect school performance and progress: (1) energy levels; (2) dexterity and motor coordination; (3) left handedness; and (4) disabilities in speaking and listening. One thing worthy of note is that only the parents whose children made poor progress pointed to the disadvantage of physical attributes, and most of these were from the suburban area.

### *Energy levels*

Three types of children were identified to be at a disadvantage because of unusual levels of energy: seven had problems from vulnerability to infectious diseases, three became easily tired from hard work, and five were overactive.

My child is particularly vulnerable to flu. Once he catches flu, he has to stay at home for at least a week. He has had flu three times since he started school. His occasional absence means that he gets left behind. (suburban, low)

My daughter is so weak that she finds it difficult to pay attention and complete the work. She is not strong enough to concentrate. She tends to give up half way through the work. (central, low)

My son is overactive. His teacher is always complaining that he does not sit still and he does not pay attention to his work. He is always screaming, shouting, running around, and touching everything and everyone. The main problem is that he never stops to think. (suburban, low)

The teachers in the suburban area confirmed that the children with these difficulties were deprived of opportunities to take part in school life and learning activity in particular. The teachers in the central area also pointed to one serious problem facing all their children - the ability to use their hands.

### *Dexterity and motor co-ordination*

Reception class was recognised as a place in which the children ought to do a great deal of written work. Yet both the teachers and parents in the central area shared the view that it was damaging for young children to have to do a vast amount of written work when they started school. It was explained that written work harmed the children's manual development by forcing motor control too soon. The teachers pointed out that the complex strokes of Chinese characters were too much for the six year olds who had not developed motor control well enough to move their hands precisely. Most children were also described as having difficulties in manipulating equipment. Some held the pencil in their palms, some held it with two or three fingers put together. It was underlined that the children wasted a great deal of time and energy by writing down many words when they would be better

spending time improving their strategies for learning to think and to solve problems. The teachers all recognised that the children got into the habit of writing as quickly as possible in their own ways soon after starting school, but for some children there were particular difficulties created by being left-handed.

### *Left handedness*

There was a big difference between the teachers and parents in their beliefs about the effects of inborn left handedness on the school performance of the children. Some parents admitted that they had forced their left-handed children to be right-handed since the moment they saw them playing with toys and using chopsticks. They wanted their children to be the same as the others, partly because the teachers taught children to write in the right-handed way. However, the teachers were all against forcing children to be right handed, if they were initially left handed. They perceived this had adverse effects on the children's performance.

As a matter of fact, the writing system of the Chinese language is easier for the right-handed children so they are better at writing than left-handed children. In my class, the children who make good progress are all right-handed. I wonder if this is co-incidental or not. I think the parents should leave left-handed children to be left-handed because otherwise it leads to tremendous pressure and frustration in the children when they do written work. (Mrs S)

Reception class is the place where a certain amount of work has to be done on schedule every day. Thus, the children cannot afford to waste time making unnecessary efforts. The work of artificially right-handed children displayed more mistakes than they should. These children also show unnecessary difficulty in doing the work. Their hands become tired very easily. Using their left hands would improve their performance and the quality of written work to a large extent. (Mrs O)

The artificially right-handed children produce mirror writing. Their work is also very untidy and they are inclined to be only half-way through the work. Consequently, they can hardly keep up with the others. I would like to see that the left-handed children can get through the work and get it right the first time. They can achieve this if they use their left hands. This would mean that they could keep up with the class and enjoy doing the work. (Mrs S)

The teachers' experience and views on the artificially right-handed children were that physical attributes could not be forced to change their natural course without

damaging the children. While left-handedness is not a natural disability, other children did show deficiencies which would affect their progress.

#### *Disabilities in speaking and listening*

A few parents were very concerned about the effect of their children's inability to speak or hear properly. It was explained that the children could not speak properly because of a dysfunctional tongue which was shorter and more tense than a normal tongue. The teachers of six suburban-area children who had this problem said that the inability to speak prevented the children from uttering certain phonemes. These children were described as having difficulty in recognising words and discriminating between different linguistic stimuli accurately. But the teachers emphasised that the main cause of the difficulty encountered by these children was cognitive deficit and language disadvantage. One child had her right ear damaged when she was five years old. Her father insisted that, after this happened, she was no longer able to count or remember much. But the child's teacher disagreed. She said that the child responded to her promptly in the class. This child showed no ability to learn anything and was still unable to recognise any numbers and phonemes after six weeks at school. The teacher contended that the child was mentally retarded and the reason for her failure at school was due to that.

#### **6.4 Concluding discussion**

The combination of the views of parents and teachers proved valuable in clarifying, corroborating, elaborating, and complementing the reasons why children succeeded or failed in school in terms of children's qualities. It was obvious that there were relationships between children's individual characteristics and school readiness with special reference to task performance. There were three important implications arising from the findings.

First of all, starting school meant different things to all those concerned. For the children, it meant the greatest step and departure point from which they grew up. It seemed that going to school was a landmark of the children's development and an important indication of *becoming bigger*, in children's own terms. For the teachers, it meant a start of a deliberate commitment to turning unfavourable characteristics of the children into those compatible with school demands. It was a task of helping

the children grow out of their early childhood. For the parents, it meant the start of their active role in formal schooling. It involved support, preparation, and help in all ways. Overall, starting school was, for the most part, a process, phenomenon, and result of the children meeting school demands embodied in a uniform set of demands within the curriculum. The children were described as being at a great disadvantage in meeting various kinds of demand in the learning tasks of subject areas under the circumstances in which the quantification on progress schedules and timetables did not keep step with the variation of classroom processes and demands inherent in the learning tasks. The shortage of time created great pressure for both the teachers and the children. The children's initial experiences of school were largely affected by the imposition of demands which were unfamiliar to them, the use of the instructional language, and a language curriculum rich in new phonetic symbols. Most of the children had developed negative attitudes and emotions about school soon after starting.

Secondly, five categories of children's characteristics were considered by parents and teachers, with different emphases, to be important for school performance and progress. Among these, there was general agreement about the over-riding importance of cognitive abilities (or native intelligence) and language skills, and these to some extent led to other problems with approaches to work, and motivation and self-confidence. There were also difficulties for many children caused by poor motor co-ordination, although sometimes these were again linked to low levels of ability. These individual differences interacted with subject matter, family background, and pre-school experiences to affect children's progress. More specifically, the children performed more poorly in the subject of language, with its complex phonetic system, than in mathematics. The children who were living in the suburban catchment area were seen by teachers as possessing more unfavourable, inappropriate and irrelevant characteristics than those living in the central area. More significantly, the children who had learning experiences which were a mismatch to school in pre-school institution had more difficulties in going about the language tasks in particular.

Thirdly, primary school and reception class did not provide the children with sensible transitional arrangements which enabled them to become familiar with strange people, a new environment, special routine practice, the norms of independent engagement in learning activity and school work and responsibility for

school performance, and above all, the demands for efficiency in the use of spoken language. To be a model school pupil, it was thought necessary for those who made slow progress to get rid of inappropriate characteristics, which were reinforced by, and to build up what the school, the teachers, and learning tasks demanded at the same time. Common to the focus of the teachers and parents was the supremacy, primacy, and dominance of officially-valued and adult-oriented aims and practices of academic learning in the reception class.

Overall, it was clear that the school performance and progress was seen by teachers and parents to be a result of the extent of the compatibility between individual characteristics and school demands. The more compatible it was, the better performance and the more rapid progress the children could make. The explanations and interpretations of the parents and teachers eventually raised questions about the roles of kindergarten education, that of reception education in practice in the acquisition of knowledge and skills, and that of parental involvement in the children's progress as a whole. Of course, this chapter has described the difficulties experienced by the children from the perspectives of teachers and parents. In both cases, the adults seemed over-ready to criticise children for their inability to cope with the demands made in the reception classes. Some teachers did recognise that the pace and the formality of academic tasks might be causing unnecessary difficulties, but generally these interviews did not criticise the severe mismatch between the demands of the school and the developmental stage of many of the children. It was only as the work of the classroom was presented, and in particular in the different ways in which teachers implemented their role, that the extent of the mismatch became clear. In the next three chapters, the nature of this mismatch will be explored, first by looking at the teachers' approaches and their consequences, and then at the individual children and the specific difficulties they had in carrying out the tasks given to them.



## CHAPTER 7

### Instructional Practices

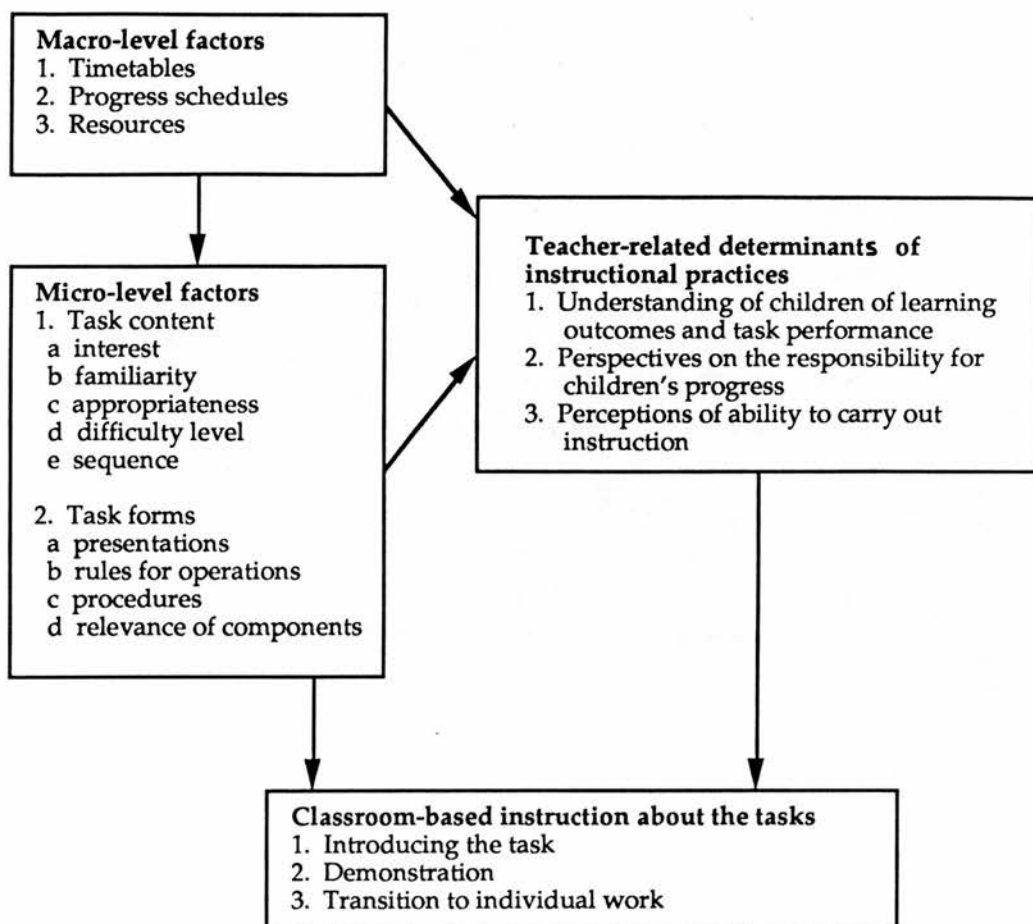
#### 7.1 Introduction

The previous chapter showed the wide range of individual differences which the children brought into reception classrooms. This chapter explores how these children were expected to develop knowledge and skills which matched the demands for particular kinds of performance through teachers' management of situational structures and materials provided. The next chapter will examine the work the children produced, as objective evidence of the match of children's abilities to situational demands.

##### 7.1.1 The framework for the categories

In developing categories which conceptually described the realities of classroom instruction in relation to the tasks and related dimensions, three types of source served as a reference framework. The first was practices of primary education in general, and teaching in particular (Alexander, 1984; Bennett, 1990; Blenkin & Kelly, 1987; Blyth, 1988; Campbell, 1985; Child, 1987; De Corte et al. 1987; Galton et al., 1980; King, 1978; Simpson & Galbo, 1986; Wittrock, 1986). The second was the nature and the elements of classroom tasks (Bennett et al., 1984; Blumenfeld, 1987; Brown et al., 1983; Doyle, 1979; 1983; 1986; Morine-Dershimer, 1985). The third was the conceptualisations of teachers' thoughts upon which their decisions and acts were based (Eggleston, 1983; Elbaz, 1983; Shavelson & Stern, 1981).

Each of these sources produced ideas which helped in deciding the best way to report the main aspects of the teachers' comments. To some extent, the framework shown below depended on the logical sequence of presenting the tasks to children, but the particular terms used to describe the categories drew on the previous literature. To make it easier to follow the subsequent detailed descriptions and interpretations, it may be helpful to provide a framework to outline the categories used to describe teachers' work, particular situations, children's performance and results, and their relationships (Figure 7.1).



*Figure 7.1 An outline of factors related to instructional practices*

Presenting the findings in subsequent sections, the comments made by the teachers will be summarised and illustrated within the framework shown above. It was found that, in some cases, there was considerable agreement among the four teachers interviewed about particular aspects of reception class teaching. In other cases, however, one or other of the teachers presented a rather different view or approach to teaching. The strategy used to present this qualitative data has been to summarise the consensus fairly briefly, using quotations to emphasise the main issues. Where differences emerge that may be relevant to difficulties experienced by pupils, however, these are pointed out, as they often implicitly suggest possible effects on the children. In this way, potential links between this chapter and the next are being established, which will be explained more fully in the final chapter. In order to make sense of the differences between teachers, the first step must be to

describe the salient differences between the teachers, before describing the specific differences in later sections.

### 7.1.2 The four teachers

The main differences between the four teachers were in the locations of their schools, and so in the extent to which parents put pressure on them, which, in turn, affected the particular teaching strategies they adopted. Together, these differences will help to explain the comments the teachers made about their experience. It should be made clear to begin with that all four teachers were experienced in working with primary school children, and young ones in particular, because they had worked in Primary 1 and 2 alternatively for at least ten years. They were all dissatisfied with the centralised school system of primary education, in general, and with the set of officially-imposed workbooks of subject areas in particular. Besides the differences related to pupil intakes, teachers also approached their role in ways which showed additional differences in specific instructional practices.

The most experienced teacher in the sample stressed in her instructions the children's understanding of what they had to do. She thought it was unreasonable for the children to be left without the full understanding necessary for carrying out the unfamiliar and inadequate tasks developed by those who, she believed, had neither real knowledge nor practical insight into primary education and school-age children. Her colleague, in the same primary school of the central catchment area, deliberately set up a structured framework for children to carry out the work.

With regard to the two suburban-catchment teachers, it was clear that one teacher specially endeavoured to lead children through the drills of required procedures within the tasks, which, she held, helped children respond to the tasks sharply, quickly and accurately, in a short period of time. In contrast, her colleague in the same primary school, laid special emphasis on the important elements of the desired outcomes to which children's attention and efforts ought to be directed. In summary, as far as instructional practices were concerned, the four teachers were respectively understanding-directed, structure-directed, routine-directed, and outcome-directed. In an attempt to make more intelligible the subsequent descriptions which illustrate relations between teachers' instruction, the tasks and performance of children, each teacher will be given the initial letter of the words

which describes the special focus of their instruction outlined above. Thus, Mrs U is the understanding-directed teacher, Mrs S is the structure-directed teacher, Mrs R is the routine-directed teacher, while Mrs O is the outcome-directed teacher.

The following presentation is divided into four parts. The first is concerned with the organisational features which affected the task-related instructions of teachers. The second indicates significant elements of the tasks and their influences on children's difficulties in doing those tasks. The third describes how the teachers presented and gave instructions for tasks. The fourth presents the teachers' perceptions and thoughts about their instructional practices.

## **7.2 Pivotal organisation-related influences**

The teachers' comments combined with corresponding observations pointed to three organisation-related factors which critically delineated task-based episodes happening in the classroom, i.e. timetables and accompanying progress schedules, the transitional period, and the resources available to present the task.

### **7.2.1 Timetables and progress schedules**

As described previously, in Taiwan reception classes, instruction is aimed at telling the children what is in the textbook and what to do in the workbook. For example, on Monday morning from 8:50-9:30 to 9:40-10:20 and on Tuesday morning 9:40-10:20, the teacher would teach the children to recognise, write and understand all the phonetic symbols, syllables and the main theme of the third unit in the language textbook. Then on Wednesday morning, in the same class, 8:50-9:30 and 9:40-10:20 the teacher would introduce the tasks of the third unit in the language workbook and then the children would complete the relevant pages. It was explained that the progress schedules were worked out before the children started school, and the schedules clearly regulated the number of units of tasks which had to be worked through weekly. In short, to ensure conformity in subject specific practice by the teachers, the subjects were strictly timetabled. To ensure teachers' accountability, the progress schedules were used based on the quantity of the children's completed work.

The teachers indicated that whereas ten periods (equivalent to nearly 7 hours) were allocated to three units of the language textbook and workbook, three periods (equivalent to 4 hours) were allocated to one unit of the mathematics textbook and workbook respectively. Such a close relationship between the timetables and the progress schedules was acknowledged to determine the pace, the coverage and the approach to carrying out the task-based instruction. It was demonstrated that, based on the relationship between officially-issued time allocations to subject areas and the coverage of units of workbook tasks scheduled to be completed, each child attempted each week about an average of thirty items in the language tasks and forty in the mathematics tasks. Teachers' experiences showed that they and the children alike had plenty of time to work through the mathematics workbook, whereas they did not have enough time to do the language one. It was mainly because, as the teachers explained, the language workbook involved the larger amount and greater difficulty of exercises. All the teachers felt that the dictation exercises were particularly to blame for this problem.

I and my pupils alike feel there is not enough time to do language work, although more time is allotted to it according to the timetable. This is due, not only to the greater difficulty of linguistic constructs and coding skills involved in the subject matter, but also to the larger number of exercises. For example, I and the pupils are expected to work through a set of dictation exercises covering fifty syllables in 15 minutes. Thus, I have to say words faster than I should. Also, the pupils have to complete another five different sets of exercises containing about twenty-five items in total. (Mrs S)

It was said that instruction was affected by other important task elements linked to the time allotted. All the teachers pointed out that the fixed timetable did not allow for the difficulty level of the subject matter, the complexity of the procedures, or full treatment of the tasks. For instance, the children could do the sums very quickly, easily and accurately, but failed to complete the word problems in addition as these were given the same amount of time to work through as the sums. The teachers all commented that time limits on word problems created considerable difficulties for both the teachers and children.

The primacy and inflexibility of the progress schedules and timetables mean that I have to cover a set of exercises in time, regardless of difficulty of the subject matter, complexity of the actual operations and children's unfamiliarity with the treatment of the tasks. For example, in the mathematics workbook, the fourth unit of tasks is given five periods

to cover ten different sets of exercises. Each set involves from two to five levels of operations dealing with the relational concept of a whole number and its two parts, which appears very difficult for the pupils to grasp. (Mrs R)

The teachers need more time to help pupils make sense of the set of exercises formulated in the ways the pupils experience them for the first time. But all units of the tasks, varying with frequency of occurrence, are given the same amount of time. I am unable to demonstrate and explain the forms of the tasks encountered by the pupils for the first time in detail, as I should, or time will run out for me in other tasks. (Mrs U)

### 7.2.2 The transitional period

The teachers pointed out that the educational authorities make the first two months of school a transitional period during which children are in school only for two periods each day. This is to allow children to adapt gradually to the significant changes they meet in formal schooling. However, for practical reasons, the four target Primary 1 schools cut short the period of transition. Consequently, the children in the central area started with normal time schedules from the third week of school, whereas the children in the suburban area began in the second week. For the teachers, normal school timetables did not even give the teachers and children sufficient time to cope with the many special school events and routine activity taking place especially in the initial phase.

Children in the first two months have a number of medical examinations which take up time allotted to the lesson activity. What is more, the school holds a school-wide sports meeting and other competitions regularly. I have to use the time, allotted to, e.g. drawing and handcraft, to teach the children the rules of games and discipline in taking part in competition and dancing. The children are expected to make their best performance on these occasions. It is because, truly speaking, the Principal is more serious about this kind of matter than the teaching effectiveness. I have to put these activities first, although they are irrelevant to the children's adjustment to school and subject-specific learning first. You will see what a great rush my pupils and I will be in as these events come near. Without others' assistance, I cannot really do more than keep the children proceeding with the learning tasks tightly according to the schedules, when time is terribly short at the beginning of school. Obviously, the pupils learn things in haste and real and deep understanding of the textbook matter and the workbook task is impossible to achieve. (Mrs U)

### 7.2.3 Available resources

As mentioned previously, insufficient and inappropriate resources available for aiding teaching caused disadvantages for the teachers and children alike. It was explained, in particular, that most of the resources were broken, out-of-date, irrelevant to the subject matter, incompatible with the task forms, or inconvenient to use.

I have to deal with a great deal of administration besides teaching. I have neither time nor money to get more relevant and useful things to aid my classroom instruction. Instead of resourcing teaching aids, the school would rather spend more on huge modern equipment which leads the parents and the educational authorities in particular to have a good impression of the school effectiveness. Thus, I cannot help depending on chalk, the blackboard, and books throughout the lessons. Being short of time, I must say that language is the most convenient tool for giving instruction. It can deliver the information to the pupils directly and immediately with little effort. Indeed, language-dominated instruction creates a serious problem for the children. There is no objective reference aiding their understanding of incoming information which takes the form of continuous and simultaneous cross-linked linguistic, symbolic and spatial representations. (Mrs O)

Clearly, the best of abilities of the teachers were very unlikely to be actualised in a context in which time was very short, the progress schedules were strictly and uniformly determined, and resources aiding instruction were insufficient and inappropriate. Confronting the learning tasks in the situation delineated by these organisation-related disadvantages, the children obviously depended upon the teachers' instruction to overcome these disadvantages and to maximise their performance.

### 7.3 Task elements

All the teachers pointed out that the children's performance on workbooks was affected by the content and the form of the task. The former was concerned with the subject matter, whereas the latter related to the construction. However, the teachers' comments on the tasks suggested that their approaches to the task-related

instruction depended on how they viewed the necessity and utility of the workbook as a whole.

### 7.3.1 Perspectives on the workbook

For the educational authorities, as the teachers indicated, the workbook served as a practical tool for reviewing and practising children's learning outcomes. Mrs U, who focused on children's understanding of task instructions, stressed that the workbooks should be planned to assess the learning outcomes of the children.

It is essential for a teacher to improve the effectiveness of teaching all the time. Therefore, it would be very useful and worthwhile to have credible and objective feedback about the learning outcomes of pupils. Clearly, a set of assessments of the children's learning outcomes is needed. Being a reception teacher in this school in the central area, nearly all of my work time is spent on administrative affairs and school events. As a result, I am unable to develop this kind of assessment. It would be ideal for the workbooks to be designed to assess learning outcomes of pupils. In practice, the workbooks currently used fail authentically or reasonably to assess the children's acquisition, due to overriding effects of the shortage of time, and inappropriate contents and unfamiliar forms of exercises. My pupils and I all feel that doing the workbook task is a nightmare.

Mrs S emphasised the advantage of the specifically structured procedures and activity of instruction. She thought the workbook should be planned to promote the likelihood of transfer of learning.

Transfer of learning is the main aim of education in the sense that the children are able to apply what they already know to solve the problems in the relevant contexts confronting them. This aim should be at the heart of the development and implementation of the workbooks as a whole. I am totally disappointed about this uniform set of workbooks in use at present. What my pupils and I have to do is to recall what has already been done in the textbook and respond to the tasks in the required ways. Since the tasks are not developed appropriately in terms of comprehensibility, introducing and presenting them to the pupils is a continuing burden rather than a pleasure. I believe that almost all teachers carry out task-related instruction only because of their professional obligation. Most of my pupils hate doing these workbook tasks.



Mrs O, who devoted her instruction to lead the children to focus on the outcomes, complained about the uselessness of the workbook. For her, there was no need for the development and implementation of the workbook.

I think all practising teachers can plan more appropriate, interesting and attainable learning tasks for the pupils whom we know better than those involved in the development of the workbooks, if time and resources are sufficiently given. Those so-called educationalists produce this useless and discouraging set of learning materials in an ivory tower. The practising teacher's practical insights and experiences are never taken into account. They forget that it is the practising teacher, instead of them, who presents these learning tasks in practice. If they came to my class and gave my pupils instruction for the workbook tasks, they would realise how unreasonable this set of learning material is.

Mrs R, who focused on drill practice, also pointed out that she could develop more suitable learning tasks for the pupils than those incorporated in the workbooks. She claimed that the workbook as a whole hindered the progress and the quality of the work of the teachers and children. At worst, as she said, the workbook was responsible for the children's hostile attitudes towards school.

It was clear that the workbook did not work in practice for the benefit of the children, as expected by curriculum planners, and it created frustration and dissatisfaction for the teachers and children. The reasons for these negative reactions to the workbook will be introduced as a result of a very close examination of specific disadvantages of the elements of the workbook tasks.

### 7.3.2 Task content

Five aspects related to the task content were described as affecting children's performance profoundly: boredom, unfamiliarity, inappropriateness, greater difficulty, and an illogical sequence embodied in the representations, topics, descriptions and treatments of the subject matter.

#### *Boredom*

The teachers all commented on the fact that most of the tasks involved the subject matter presented by representations which hardly aroused and maintained the children's interest to stay with the work as long as they should. They stressed that their difficulty in motivating the children in the main resulted from the boredom of

the representations running through the tasks. Phonetic symbols were pointed out by all the teachers to illustrate this disadvantage facing the children as they did the work.

Phonetic symbols in their own right are simply symbols and, I am sure, none can enjoy their abstract, mechanical and instrumental modes. Indeed, language tasks in phonetic symbols make children only turn their head away from work. Children always sigh when they have to deal with phonetic symbols. I don't exaggerate their responses. I can see that they don't have enthusiasm, interest or patience with this kind of representation at all. (Mrs. U)

The children were also said to be tired of the tasks which involved dreary topics. Three examples can be used to illustrate why the teachers were dissatisfied with the material.

#### UNIT ONE

Sky turns bright  
I wake up  
The sun also wakes up  
I get up early every day  
The sun also gets up early every day  
I rise early day by day  
The sun also rises early day by day

#### UNIT FIVE

This is the blackboard  
This is the chalk  
I hold the chalk to draw an aeroplane  
The line is very straight  
The circle is very round  
The aeroplane is very large  
We all can draw very well

#### UNIT SEVEN

The little bird loves singing  
You sing here and there  
Your songs are sung very nicely  
Many birds are on the trees  
They sing together  
You also sing  
I also sing  
Beneath the trees there people who also sing  
You also sing  
I also sing  
Do Re Mi, Mi Fa So  
There are more birds on trees than there are people

It was indicated that the boredom of the exercises was also caused by the particular treatment of the thematic matter. The teachers explained that the thematic matter of each unit of the tasks was repeatedly presented as the information base of all composite exercises.

For instance, twelve syllables run through six sets of exercises in the sixth unit of the language workbook, consisting of 46 items in total: handwriting, dictation, true-or-false, fill-in-blank, look-and-say and alternative choices. This means that the pupils are confronted with all these twelve syllables when doing six sets of exercises. Of course, they feel terribly bored with the same modes facing them repeatedly. It is certainly a worse consequence because phonetic symbols create no fun for them at all. They are also faced with this kind of boredom when doing the mathematics tasks. They are repeatedly confronted with numbers in tens, which are so familiar to them, in all kinds of exercises incorporated into seven units of tasks. They always sigh before they get started. (Mrs O)

### *Unfamiliarity*

By unfamiliarity, the teachers meant that those produced in the content of the tasks were remote from the children's experience. The teachers' criticisms on unfamiliarity of the task content fell into three aspects: the mode, the information background, and the language usage. With regard to the unfamiliar mode, the teachers all referred to phonetic symbols. Without direct experience of phonetic symbols in the everyday context, as the teachers stressed, the tasks in phonetic symbols made little sense to the children.

It is absolute certain that most children who are unable to get on with language tasks in phonetic symbols learn the Chinese characters easily and quickly. Notably, they make very impressive progress in learning Chinese characters and perform better in the tasks in the Chinese characters. To the best of my knowledge, it is mainly because the children have experienced Chinese characters in almost all dimensions of everyday life inside and outside school. They experience phonetic symbols only in the deliberately-planned environment like the school and the kindergarten. Such unfamiliarity with phonetic symbols leads the children to have great difficulty in linking their understanding of the focal points in the auditory modes with these unfamiliar marks on paper. (Mrs O)

Unfamiliar background information was described as being the context of the tasks which caused difficulties to the children processing information about the representations that the children perceived.

For example, the pupils are required to describe a family getting up early to do things they hardly see or experience. These episodes are illustrated in unimaginative pictures: the father wears old fashioned clothes and a hat specially for farming and sowing in the field, the grandfather puts on traditional Chinese long gown watering flowers in the garden and the mother feeds pigs. My pupils all live in this prosperous area where this kind of life style does not exist. How can we require them to describe episodes they rarely see in real life easily and quickly? (Mrs U)

The teachers indicated that the children also found it hard to cope with tasks involving a number of phrases and usages presented in either classical or formal styles which were not widely used by the children. The uncommon language expressions were said to deter the children from constructing the meaning out of the whole descriptions.

#### *Inappropriateness*

The children's difficulty in doing the work was identified as being closely related to inappropriate task content in three areas: incomprehensible representations, unreasonable treatments, and unrepresentative illustrations. As far as incomprehensible representations were concerned, all the teachers took manual-drill exercises in the first unit of language tasks as an example. It was said that neither the teachers nor the children could make sense of the spatial dimensions of the shapes which were too odd to be imitated as required. Figure 7.2 shows this unreasonable set of manual-drill exercises.

Although these spatial representations contain simple strokes, they are the shapes even I do not know where to start copying. These exercises are aimed at mastery of manual movements by drills with pens in order to learn to write words easily and accurately later on. Those shapes are not easy enough to allow children to move their hands and wrists freely. Children all feel very frustrated doing this set of exercises with less than half the accuracy required, despite strenuous effort and using more time than expected. (Mrs R)

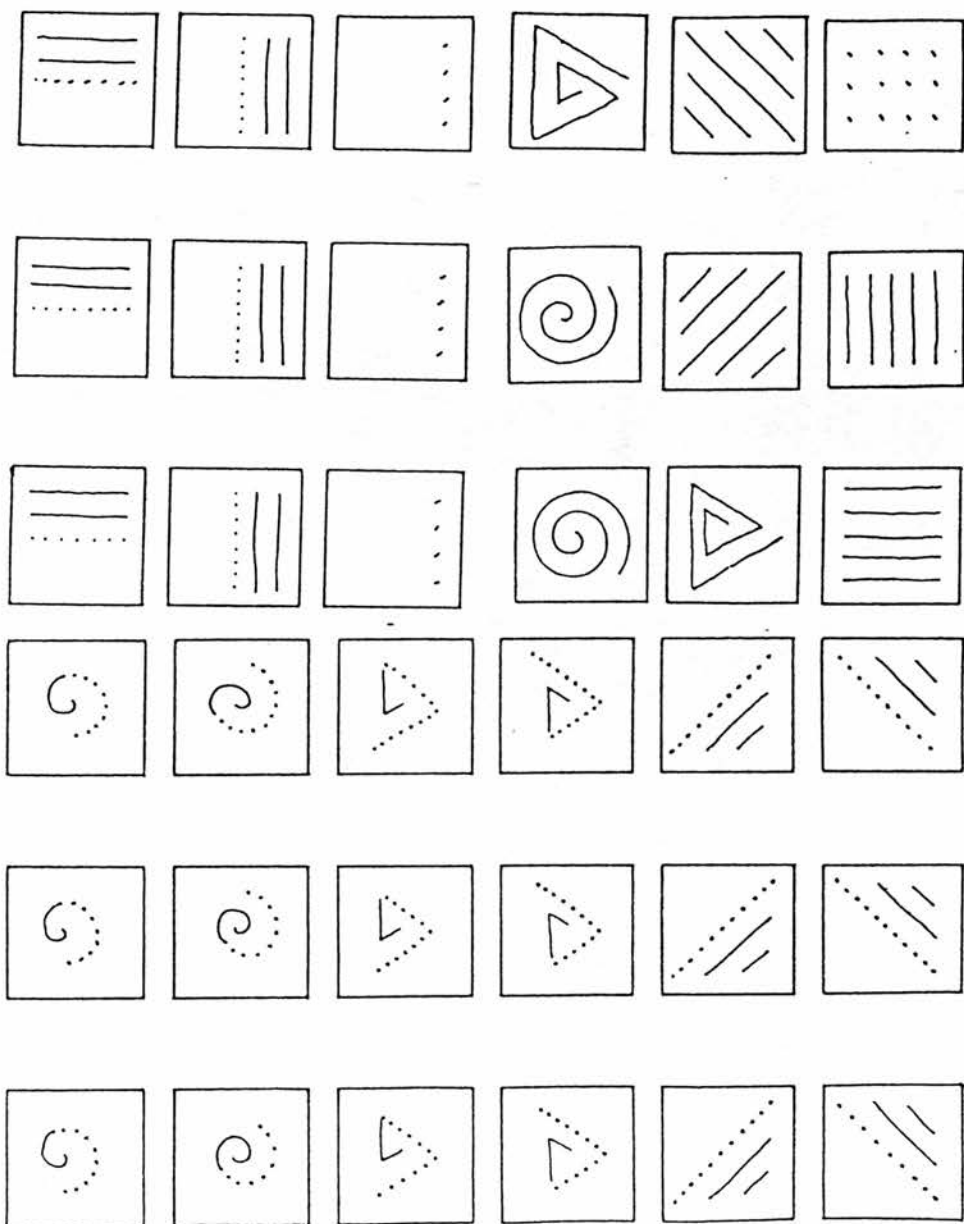


Figure 7.2 An example of incomprehensible representations

The true-or-false exercises in language tasks were pointed out as an example of unreasonable treatments of tasks which puzzled both the teachers and children. The teachers' comments identified three main problems this kind of task produced for the children, as follows.

In this set of definition exercises, children are required to make judgments on the accuracy of the statements presented as definitions of the key words in questions. If they think the statements convey accurate meanings of the key words, they mark circles. Otherwise, they put crosses. But it is unreasonable for the children to make judgments on the accuracy of definitions which contain key words. For example, one question asks if it is correct to define *Still* by saying that *Still: There are two pens on the table. There is still one pen left on the table after taking one away.* Whereas the other question asking *Piece* by saying that *Piece: Paper can be also said as a piece of paper.* ...Honestly speaking, I find it very hard to explain the demands for judgments on the accuracy of definitions under such circumstances in which definitions of the key words are not authentically reflected in the statements involving the words themselves. The tasks are more like make-up-sentence exercises. These inappropriately-made statements confuse the children so much that they find it hard to make decisions on the accuracy. Many children can demonstrate their understanding of these simple and familiar words in their own terms, although they fail to do so in this set of exercises. (Mrs O)

Mrs U commented on another similar exercise.

Mark a circle if it is correct and a cross if it is incorrect in parentheses

- ( ) 1. Hold: Hold things on the back.
- ( ) 2. In: Putting books on the table can also be said that there are books in the table.

*Figure 7.3 Two example items in true-or-false exercises*

I found it very hard to explain what to do with this kind of work when I myself get stuck at the incompatibility between the nature of the problem and the ways of answering the questions. I don't think that meanings of verbs and propositions can be defined well by the declarative statements put into clear-cut dichotomies of truths or falsehoods. Take two items presented above as examples. The first item involving the key word of *Hold* makes up a sentence rather than states its definition. More significantly, *Hold* is a verb so that its meaning of motion cannot be reflected through a verbal expression. In teaching this vocabulary planned in the same unit of the textbook two days ago, I asked if the class knew what *hold* meant. Many pupils demonstrated the action of holding something in hand. I think this is the better way than a

statement to see whether the children understand the meaning of a verb... The second item concerned with the proposition of *In* caused the same difficulty for the pupils as the the first item does... This kind of definition exercise in the form of clear-cut dichotomies of truths or falsehoods has another problem causing difficulty for the children. Unless the statement absolutely excludes all possibilities except the circumstance as described, I have to leave the answers open to my pupils. Too few things or states can be absolutely absolutely decided as black-or-white.

It was also said that children's difficulties were due to the illustrations which were too poorly drawn to be seen as the actual objects they were meant to represent in the tasks.

In unit thirteen of the language workbook, the children are required to look at these pictures and fill the appropriate words in the blank spaces inserted in the descriptions which state the meanings of the pictures. The children find it hard to do this set of exercises. It is mainly because the pictures are too poorly drawn to enable the children to understand what they actually mean. For example, clouds and trees illustrated in the first picture do not clearly and accurately show the actual state of the weather. A young lady with an open mouth in the second picture confuses the children with ambiguity between singing and speaking. (Mrs S)

### *Great difficulty*

The children were described as having greater difficulty in grasping certain domains of knowledge and skills involved in the tasks. The teachers all commented on the fact that the knowledge and coding skills of phonetic symbols were absolutely beyond the children's reach. It was specifically explained that children of average linguistic ability could not come to terms with the complex demands for processing this kind of linguistic representation. It was indicated that in dealing with exercises in this kind of written mode, the children needed awareness of the relationships between linguistic constructions, literary knowledge of written marks, and sophisticated skills of decoding and encoding separate constructs including the tones. Furthermore, the omissions of punctuation were recognised as causing the children greater difficulty in understanding meanings of the text presented in phonetic symbols.

In doing the language tasks in phonetic symbols in the initial ten weeks, most pupils read questions, statements or discourses from the beginning to the end without necessary pauses due to the omissions of

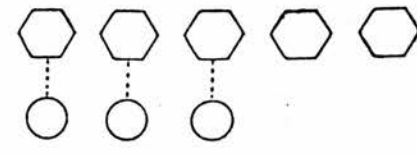
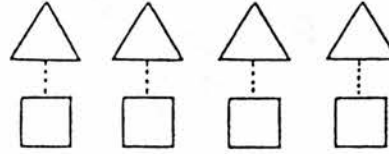
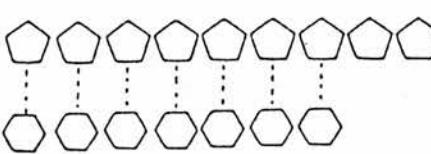
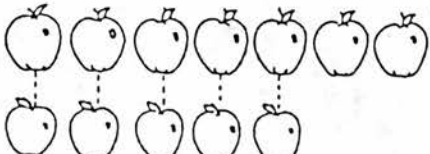
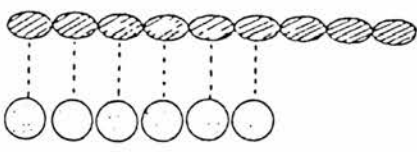
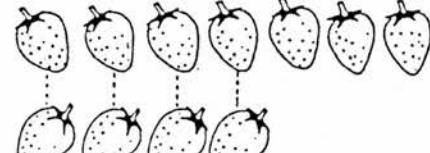
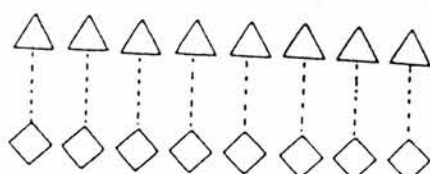

<p>①</p>  <p><math>5 - 3 = ( \quad )</math></p>	<p>②</p>  <p><math>4 - 4 = ( \quad )</math></p>
<p>③</p>  <p><math>9 - 7 = ( \quad )</math></p>	<p>④</p>  <p><math>7 - 5 = ( \quad )</math></p>
<p>⑤</p>  <p><math>9 - 6 = ( \quad )</math></p>	<p>⑥</p>  <p><math>7 - 4 = ( \quad )</math></p>
<p>⑦</p>  <p><math>8 - 8 = ( \quad )</math></p>	<p>⑧</p>  <p><math>6 - 4 = ( \quad )</math></p>

Figure 7.4 Examples of subtraction exercises based on unmatched differences



punctuations. In fact, under such circumstances, the pupils are inclined to decode phonetic symbols and blend them into the syllables at most. Therefore, it is very difficult for them to do the comprehension exercises in phonetic symbols in the sense that they cannot understand the meaning of the text in all forms on the basis of the fragmented symbols they decode. A few children making random or wrong pauses have very little understanding. (Mrs O)

As far as the subject of mathematics was concerned, certain knowledge, relational concepts and arithmetical operations were said to be difficult to absorb, such as ordinals, the zero, part and whole of a number, and subtraction. It was revealed that two thirds of the children were unable to work out equation statements of subtraction when solving problems presented with pictures showing differences in the quantities between two sorts of objects. The teachers suggested that the children were stuck at this kind of exercise because they could not grasp the relationships between the concept of subtraction and differences embodied in two rows of distinctive objects in juxtaposition (see Figure 7.4). It was explained that the children could appreciate the concept of subtraction actualised in the way in which one sort of object was to be left out, more easily than they could in the way two sorts of the object were presented in rows.

Semantic structures of word problems of addition and subtraction were recognised by all the teachers as causing the greatest difficulty for the children. Figure 7.5 provides four examples.

- 
1. I am 6 years of age. I am 3 years younger than my brother. How old is my brother?
  2. I had some pens. I gave my sister 5 pens. I now have 4 pens. How many pens did I have in the beginning?
  3. Shaw-Ming has 3 oranges. Shaw-Hau has 8 oranges. How many more oranges does Shaw-Hau have than Shaw-Ming?
  4. I had 2 sweets. My mother gave me some more sweets. I now have 10 sweets. How many sweets did my mother give to me?
- 

*Figure 7.5 Examples of word problems of addition and subtraction*

To the best of my knowledge, most of my pupils have difficulties in reading through all questions written in Chinese characters, due to the limited number of words they have learned - far less those who are at a great disadvantage. More significantly, they cannot relate numbers, symbols of addition, subtraction and equality to differing meaning attached to the semantic unit as you call it. This kind of exercise requires

the pupils' high-order intellectual and linguistic processing of information. I personally think that it is beyond the cognitive and linguistic development of average children of this age. If I read the questions for the class, most of my pupils can give me the correct answers. For example, in the first item, many could say to me " $6 + 3 = 9$  and the brother is 9 years old" after they heard me saying "I am six years of age. My brother is three years older than I am. How old is my brother?" In fact, you can tell that, I change the wording but the meaning remains unchanged. Thus, I can be so certain that semantic units involved in the word problems cause greater difficulty for the pupils than curriculum planners can imagine. (Mrs U)

The less able children were described as having greater difficulty in doing the tasks which involved multiple demands on intellectual functioning, language skills and problem-solving strategies.

The difficulty in doing the tasks is much greater than the children can cope with where they are required to process information about various kinds of representations at the same time. For instance, every pupil ought to undertake six levels of information-processing in the look-and-fill-in-blank exercises: (1) making sense of the pictures given; (2) decoding of descriptions written in phonetic symbols and Chinese characters underneath the pictures; (3) understanding the meanings of the descriptions; (4) having the knowledge of the words appropriate for the blank spaces; (5) filling the needed words in the blank spaces; and (6) examining the accuracy of the answers on the basis of the relevance of the words filled in the blank spaces to the meaning of the descriptions provided. I think this kind of exercise is too difficult because it makes demands on the children at many levels of processing at one time. (Mrs O)

### *Illogical sequence*

It was found that the children's difficulties were also due to a big gap in subject-specific knowledge and skills incorporated in the consecutive units of the tasks. The teachers all made similar comments on the fact that most of the children found it hard to go about the current unit of tasks where it was markedly different from the previous unit.

The children who perform poorly have difficulty in proceeding to the third, the fourth and the fifth units of mathematics tasks. The third unit is concerned with the number facts and the sums in the form of one-to-one correspondence between the objects, circles, and numbers. The fourth is related to number order, the ordinal numbers and spatial representations. The fifth centres on part and whole of a number. It often happens that the children are confronted with a big gap in the

nature and demands inherent in the factual knowledge and skills involved in these three successive units. This big gap causes great difficulties to the children in the sense that they have to absorb, consolidate and apply newly-demanded knowledge and skills in a short time. (Mrs U)

It became clear that, apart from the children's own disadvantages, the task content put the children at a great disadvantage in doing the work. As indicated above, they had to deal with the difficult and unfamiliar subject matter, uninteresting topics, unreasonable treatments of representations and inappropriate and multiple demands. The teachers also reported that the task form also caused difficulty for the children, as we shall now see.

### 7.3.3 Task forms

Five factors related to the construction of the workbook tasks were described as putting the children at a disadvantage in doing the work: confusion from presentation, rules for the required operations, complexity of procedures, and irrelevance of components.

#### *Confusion of the presentation*

It was recognised that the children's performance was affected by the confusing and misleading presentation embodying the task demands. All the teachers chose the set of handwriting exercises as the best example of this. The children were required to get the dots into the shapes of words. Of the words given to them, as the teachers pointed out, some were shaped as single words and others were compound phrases in the form of incomplete and complete representations. The teachers explained that the children did not know if they should simply complete the dots as presented, or turn the dots into meaningful words. The teachers instead explained that the children's confusion about the demands of the exercises because of previous experience with the dictation exercises in which dictated words were similarly structured in dots.

In considering the dictation tasks of the initial units formulated in dots, the teachers all commented on the fact that the physical arrangements of the dots were irrelevant to the purpose of dictation. The teachers said that they had difficulty in explaining to the children why the words which were to be dictated had already been printed

in dots as answers on the paper. The teachers noted that the children found it particularly hard to make sense of the demands for encoding their words in this set of exercises. In informal examinations, as the teachers explained, the children were to put down what they heard from the teachers straightaway, without any concrete cues available during the dictation. It was pointed out that, in doing the dictation tasks in dots, the children tended to make the shapes by drawing lines between the dots, although the dotted shapes were only part of the dictated words. Without accurate encoding, as the teachers emphasised, dots could only mislead the children into incorrect results. The following phonetic symbols in English (see Figure 7.6) which designate 'old', 'dog', 'cat', 'bird', 'cow', 'one', 'two' and 'three', illustrate the confusion this kind of dictation exercise creates for the children.

ɔɪD	DOUG	Kœt	BƏD
kau	wan	TU:	ØRI:

Figure 7.6 An example of dictation exercises in language tasks

#### *Rules for the required operations*

It was recognised that some special forms of the tasks required particular awareness and understanding of the way in which the tasks should be carried out. It was explained that, for instance, although the children had been told to demonstrate a correct answer (a phrase) for a question (a sentence) presented in the two-choice exercises by circling it, they had to put the one phrase thought to be correct in a big circle. The teachers indicated that most of the children making slow progress put either two phrases or a whole sentence in a big circle as the correct answer for the question. As the teachers explained, it was mainly because these children failed to understand the idea that choosing the correct answer meant an either-or rather than none-or-all matter. More specifically, these children were described as being unable

to recognise the hidden rule that only one answer was allowed for one question, even though they felt both possible answers given were correct.

One-to-one-correspondence language exercises were identified as further examples of this problem. The exercises were said to require drawing a line between one clause and another to complete a meaningful sentence. In tackling the exercises, the children had to be aware that one clause was connected to another clause through a line, as complete sentences were to be joined up. All the teachers said that, despite repeated emphasis on this rule, most of the children found it hard to do this work when they were to choose one of many clauses, and particularly those which shared the key points. The children were also described as showing similar difficulties in the one-to-one-correspondence mathematics exercises.

#### *Complexity of procedures*

Multiple steps of procedures and actual operations were recognised as complicating the thoughts and actions of the children who had acquired only a small body of knowledge and skills at that time. The teachers all pointed to the first set of exercises in the fifth unit of mathematics tasks, concerned with whole and part of a number, as illustrating this disadvantage best. The detailed illustration and discussion on this set will be provided in Chapter 9 which presents four case studies. The main cause of the difficulty the children had in doing this set of exercises was said to be a combination of four interrelated steps of procedures and three required operations. The children were described as either being confused by the within-step mutual interference of procedures or failing to keep in mind the relationships between the required operations from the start of work to the end.

#### *Irrelevance of components*

It was recognised that the children easily got stuck at tasks which involved components which were not closely related to each other. This internal inconsistency between the properties were said to cause difficulty for the children grasping the main ideas and sorting out appropriate actions upon the work. The dictation exercises presented in dots, which were described above, were identified as an example in terms of the incompatibility between task demands for dictation, the mode (the dot), and comprehensibility and completeness of the layout.

To my knowledge, all primary teachers dictate the words to their pupils as soon as they finish teaching the new syllables and Chinese characters of each unit in the language textbook. ...It is because we all believe dictation enables the pupils to consolidate their ability to perceive and produce accurately the words they have just learned when their memories of these new representations are still fresh in their minds. Every pupil has got a notebook specifically for dictation which is comprised of small squares arrayed in, on average, seven columns and twelve rows. They are drilled to write down as soon as they recognise the words I say to them. They leave the squares untouched if they neither recognise nor produce the dictated words expected. Although there are no cues like the dots given in the set of dictation exercises in the workbook, pupils find it much easier to do dictation in the notebook. I tell the pupils repeatedly that a dictated syllable or Chinese character is presented as a whole geometric entity. Therefore, dotted shapes do not make any sense to them as far as the dictated word is concerned. The dotted shapes do not necessarily mean dictation. More significantly, although I sound out the words the dotted shapes imply, the dots interfere with the pupils' perceptions and productions of the words. Instead of drawing pupils' attention to what is said by me, the irrelevant dots hold their thinking still on what these dotted shapes may represent. (Mrs U)

It was clear that inappropriate and demanding subject matter and the construction of the tasks caused separate and interrelated difficulties for the children. Although the tasks were not as well developed as expected, the teachers were obliged to present and explain the tasks to the children sufficiently and effectively enough to lead the children to make optimal performance. The following section tries to present a realistic picture of how the teachers gave instructions for the tasks. It is described in some detail, as it became clear that instructions given played an important part in mediating the difficulties involved in the workbooks.

## 7.4. Task-based instructional practices

### 7.4.1 Teachers' task-specific instruction

Although there were differences between the four teachers in focal points, management, and commitment to the tasks as described above, there were also similarities in the task-related instruction carried out in the classrooms observed. Instructional activity was continuously carried out and there were no clear boundaries between various kinds of activity. For convenience of presentation, the instructional activity observed across the four classrooms was categorised into three phases, according to the functions and the content of the activity. In the first phase,

the tasks were introduced to the children. In the second phase, the inherent demands and required operations were demonstrated and explained. In the third phase, the teachers' emphasis was put on particular aspects before the children started work.

### *Introducing the tasks*

Overall, the teachers seemed to start task-specific instruction in the same way, although there were small differences in the monitoring of the start of the class and announcing the subject areas to be done in that period. It was clear that the teachers' introduction was aimed at defining and locating the scheduled tasks. More precisely speaking, the predominant activity was perceived to lead the children to find the tasks. It was noted that the teachers endeavoured to guide the children in the right direction by giving them necessary information, such as the names of the books, the titles of the unit of tasks, the number of the first page of tasks, and headings or written instructions of the first set of exercises. In attempting to help the children get on to the scheduled tasks quickly, the teachers were seen to provide the children with relevant cues and put the necessary information on the blackboard. This seemed to give the children a frame of reference to locate the tasks. The teachers helped the children find the tasks in these concrete ways more frequently in the initial phase of school than later on.

Mrs R focused on routine practice throughout the instructional sessions. At first she drew the children's attention orally to the colours and illustrations on the covers of their workbooks. This seemed to help the children find the tasks in their books. She then repeated the number of the page where the tasks started.

In contrast, Mrs O focused on the required elements of desirable outcomes of work. Straight away she told them the unit and coverage of tasks to be done. She would emphasised particular objects illustrated in the covers if she saw most of pupils were unable to get the books ready on the table.

Mrs U focused on the children's understanding of the instructions. She put Chinese characters representing the names of the workbooks, the title of the unit of the tasks and headings or written instructions of integrated sets of exercises on the blackboard, and helped the pupils to recognise them. The less able pupils were then selected to explain what the headings or written instruction meant. She was

obviously keen to see if the class followed what had been said by asking the ones she thought to be the most unsettled in the class, or at that time in particular, to repeat what she just mentioned. Finally, Mrs U summarised the meanings of the written instructions and stressed the key points mainly concerned with what to do with the tasks.

Mrs S focused on the structure of the activity proceeding to actual operations. She copied the scheduled tasks on small pieces of card beforehand and began her introduction by directing the pupils to recognise all necessary information underlined on the blackboard. She made the key points to which the pupils' attention was intentionally directed in different colours. The pupils were encouraged to explain the points underlined in different words. Mrs S then drew the conclusion that those differently coloured words were meant to reveal the required operations and inherent demands to the pupils. The following extract illustrates what and how the tasks was introduced by Mrs R in a language session.

Mrs R gave instructions for the third unit of the language tasks of the first volume

Mrs R: We went through the third unit of the language textbook last period. Therefore, we are going to do the third unit of tasks in the language workbook this period. Now, everybody put your language workbooks on the table.

(Pupils who behaved correctly got their books and put them on the table immediately. Most pupils attempted to look for the books in their schoolbags or drawer. Other pupils, however, sat still and stared at neighbouring classmates getting the books ready and did nothing, or first watched their classmates doing it and then followed them. A few randomly got any book without caring if it was the one Mrs R asked for.)

Mrs R: No. Not that one. (She saw many pupils getting the wrong books and others having difficulty in getting the right one.) Look at my book here. It is the blue one, not the brown one. The brown one with teddy bears and some toys illustrated on the cover is the mathematics workbook. I want you to get the language one with the blue cover. The one we are going to do is the first volume written in phonetic symbols. The second volume is written in Chinese characters. Both the first and second volumes have the same colours and same titles.

(Mrs R accentuated 'the first' and pointed to the Chinese characters of 'the first volume' on her book and showed them to the the class. Most of the children who



performed poorly appeared to be either breathless, tired of finding their books, or indifferent to Mrs R)

Pupils: I found it!

(Loud responses from the pupils who were achieving well in particular. A large proportion of average children also responded. The pupils who were doing badly had been either looking around, playing with stationery and litter, turning the books page by page, talking to their neighbour classmates, quietly looking outside through windows, daydreaming or scribbling.)

Mrs R: Now, let's see the third unit, page twelve, *My schoolbag*.

(Mrs R turned her book to the page and accentuated the word of satchel simultaneously. She found some pupils turning pages aimlessly.)

Mrs R: Page twelve, the third unit - *My schoolbag*. (Mrs R accentuated the number of twelve) (Many target children under observation attempted to ask neighbouring classmates where the number of twelve was.)

Zeng: I cannot find the number 1 and 2, Mrs R (This pupil perceived the number of twelve to be a combination of 1 and 2 which was not the Chinese-style number of twelve used in the language workbook.)

Mrs R: Koung (sitting in the front of Zeng), you show Zeng where the page twelve is.

Mrs R: Hands up if you have got the same pages as me. (About two thirds of pupils raised their hands.)

Mrs R: Fine. Have you found the title of this unit of tasks? It is entitled *The third unit, My schoolbag*. Well, let's have a look at the first set of exercises for now. Do you see the first set of exercises? What is the heading? Can you all read it?

Pupils: Yes. (A few pupils who were doing well responded quietly.)

As the children became familiar with the routine activity of the teachers' introduction, it was clear that they spent less time getting the right books out and finding the scheduled tasks. The following extract shows that Mrs S introduced the tasks to her pupils in ways seen to be very different from those undertaken by the other three.

Mrs S carried out the instructions for the first set of the first unit of the language tasks of the second volume

Mrs S: Everybody, quiet please. Are you ready for this lesson? Take your handkerchief and dry your sweaty forehead.

Mrs S: Hurry up! We are going to do the second-volume language workbook. (All the class shouted for joy)

Mrs S: What do you know about this volume? Is it different from the first one we have already done? Peng, would you like to tell us? (Peng was one of those who forged ahead)

Peng: The first one is written in phonetic symbols and this second one is written in Chinese characters.

Mrs S: Do you like doing the one in phonetic symbols or in Chinese characters?

Class: Chinese characters. (unanimous and loud responses)

Mrs S: So we can start to enjoy characters from now on. I would like you all not to take your workbooks out at the moment. We must know something before we start looking at the books.

Mrs S: Can you see these small pieces of card I have put here? Can you see those highlighted by different colour? Hands up if you cannot see them clearly.

Mrs S: Well, let's come to those coloured in red, first. Can you tell me what they mean to you?

Class: The numbers of the sets of exercises.

Hunsi: (asked to go to the blackboard, he pointed to the numbers.) One, two, three, four, five, and six.

Mrs S: What does it mean by *six*? Shong, please.

Shong: It means we have to cover six sets of exercises in this unit. (one of the top pupils in the class)

Mrs S: How about those underlined in yellow? What are they meant to be?

Class: The written instructions. (The replies were led by the top pupils)

Mrs S: Nayan? (one of the target pupils who was doing badly) Nayan, what are these written instructions for?

Nayan: (stayed silent)

Mrs S: Who else can tell us what these written instruction are for. Inean, please.

Inean: They tell us what we have to do with the exercises.

Mrs S: Very well. Shall we give her 'loving' applause? (The class applauded)

Mrs S: Indeed. We know what to do with the exercises by understanding the meanings of the written instructions, don't we?

Class: Yes. (shouted for fun)

Mrs S: Now, can you all see clearly where the written instructions of six sets of exercises are? (Mrs S showed four small pieces of card to the class)

Class: Those written in yellow. (Almost all pupils responded although three target pupils who were doing badly and one target pupil doing well were looking at their books, turning over the pages for fun and playing with pencils.)

Mrs S: That's right. I underline the written instructions in yellow. Now, let's look at the written instruction of the first set. Can you read it? (Some pupils put their hands up.)

Like other teachers, Mrs S carried on in the same manner giving interactive instructions for all written instructions of six sets of exercises. Having led the children to find the scheduled tasks and pointed out necessary information, the teachers explained and demonstrated the integrated components shown on the surface, intellectual and language demands and required operations in detail.

### *Demonstration*

It was clear that demonstrations with special attention to task forms predominated over task-specific instruction across the four classrooms observed. Overall, the similarities of the teachers' focus and approach at this stage showed that demonstrations in the main involved six features: (1) articulation of the written instructions or headings for comprehension; (2) definitions of integrated representations; (3) identifications of inherent demands; (4) presentations, explanations and exemplifications of the required operations; (5) connections between representations, the demands and actual operations; and (6) summary of the standards required for correct results.

It was noted that there were more salient similarities than differences between Mrs R and Mrs O in demonstrating and explaining the tasks to the pupils. Both of them depended largely upon their oral language to deliver the information necessary for the pupils' completion of the work. It was also seen that their pupils did not take any active part in the instructional activity. More significantly, their demonstrations did not involve substantial and practical explanations which enabled the pupils to relate their existing knowledge and skills to the demands of the tasks for intellectual functioning, language facilities and actual operations. More specifically, as far as the written instructions or headings of the set of exercises were concerned, Mrs R and Mrs O read the sentences verbatim for the class and then directly pointed out that those verbal expressions were to indicate what to do with the tasks. It was seen that there were neither guided reading nor explanations of the sentences given in a more detailed and concrete way at this stage. In contrast, Mrs R picked up and underlined the unfamiliar words or phrases in particularly bright colours, emphasised them, and asked the pupils to repeat them. Mrs O read the sentences only once for the class and went straight on to define the integrated representations. In defining the representations, the two teachers gave their pupils factual information about representations shown on the surface, namely, what they

were. However, it was seen that both of them generally ignored the background stories presented as the contexts to which the meanings of the representations were attached. Having given the pupils factual information about the integrated representations, the two teachers described orally the required operations.

As far as Mrs R was concerned, more examples, like the scheduled tasks, were drawn on the blackboard than those by the other three teachers. It was seen that the first example was picked up to show the class the steps and standards of actual operations required. Mrs R told and physically showed simultaneously what to do, step-by-step, on the blackboard, and indicated what was wrong to do, in order to stress the criteria for the required operations. Occasionally, Mrs R picked out some pupils who did not pay attention or seemed to be puzzled by the demonstration to give answers. Other examples shown on the blackboard were subsequently done by Mrs R herself under these pupils' instructions. More specifically, Mrs R asked pupils to instruct her what to do with the examples step-by-step and either the whole class or individuals were required to make comments on the accuracy of the instructions. Mrs R then gave another two or three examples in the same form and selected the less able pupils to deal with them on the blackboard, if time permitted. It was found that Mrs R, instead of the class, led the discussion and gave the the reason why some outcomes were not correct. Mrs R was then seen to draw the pupils' attention to the standards of accurate operations by showing correct actions quickly and emphasising the key points they should not leave out. Overall, the pupils had indirect practice of the required operations as they only orally described and matched the necessary actions for the most part. Interviewing Mrs R indicated that shortage of time led her pupils to experience the actual operations verbally more than physically. Mrs R explained that the pupils could absorb and carry out the operations as long as they followed the process of undertaking the exercises.

In contrast, Mrs O gave a shorter presentation of the task than that given by the other three. It was seen that Mrs O told the class nearly exactly what was written and illustrated in the tasks on most occasions. More specifically, having quickly read the written instructions of the scheduled exercises, she was seen to take the first item as an example to demonstrate the required operations. Mrs O demonstrated the tasks in the form of concise and factual descriptions of the actual operations with the emphasis on the necessary components in the outcomes. In drawing the pupils' attention to the necessary components of the outcomes, Mrs O

showed separately on the blackboard how these components should be carried out. It was seen that Mrs O's demonstrations gave neither explanations of the meanings of the operations, nor elicitation of approaches to relating the operations to the representations and inherent demands. The actual operations were stressed repeatedly as the components of the desired outcomes all the pupils had to work out. Overall, Mrs O's demonstrations were characterised by continuous discourse without pauses and without pupils' active participation. As Mrs O explained in the post-task interviewing, detailed explanations and demonstrations took too much time, and did not work as well as expected, because most of her pupils had intellectual and linguistic deficits. Clear and firm information, and emphasis on what they should present in their work, were said to be more practically useful.

In defining the meanings of representations, Mrs S mostly asked the less able pupils to say all the tasks showed to them on the surface, the average pupils to give the meanings of the identified representations either in written or pictorial modes, and the top pupils to explain why the representations were presented in the ways shown. The top pupils' explanations were seen to be used to identify the inherent demands for intellectual functioning, language processing and actual operations in concrete terms. Two or three pupils were then selected to explain what they thought they had to do in the tasks. Mrs S would ask other pupils to give her the correct answers if she was given irrelevant or inaccurate replies by those selected. The class was then asked to decide which specific operations everyone should do. Having concluded what was to be thought and done, Mrs S listed the sequence of the inherent demands and required operations by numbers. The class was asked to repeat the list of demands while Mrs S took out some small pieces of card on which the examples involved the same patterns of representation, the same inherent demands, and the same required operations as those incorporated into the scheduled tasks. It was found that, by and large, the less able pupils were selected to do most of the examples on the blackboard, average pupils were invited to revise the errors, and the top pupils were asked to explain the reason for the inaccurate results. The class was then asked to repeat the key points involved in the tasks in terms of thoughts and actions. In short, Mrs S tended to promote and consolidate pupils' understanding of the tasks through pupils' explanations in their own terms, and step-by-step structured participations of discussions and rehearsals, i.e. direct and indirect experience of the inherent demands and required operations. In post-task interviewing, Mrs S indicated that her structure-focused instruction was very

effective, but it was time- and energy-consuming prior to and during the instruction. Where time was short, as she explained, this kind of instruction would be given particularly for the tasks causing greater difficulty for the children.

The following extract illustrates Mrs U's demonstrations aimed at promoting the pupils' sufficient understanding of the tasks.

Mrs U demonstrated the ninth unit of the first-volume language tasks

(Mrs U quickly drew the set of exercises on the blackboard when the children were getting their language books out)

Mrs U: Now, let's move to the fourth set of exercise. (Mrs U just finished demonstrations of the previous three sets of exercises in the ninth unit) Everybody point your fingers to the written instructions for the fourth set. Hands up when you get it! (Almost every pupil raised their hands.) Hurry up if you haven't found it. On page twenty-five. Look at the number on the right margin of the page. Page twenty-five. (emphasised the sounds of the number)

Mrs U: Now, everyone should try to read the written instructions in either phonetic symbols or Chinese characters. (Some began decoding phonetic symbols. Others attempted to follow and imitate sporadic sounds spelt out from those who were capable of transcribing syllables directly. Most of the children who were doing well read Chinese characters loudly)

Class: (Read the written instructions loudly in chorus) *I can look at the pictures and fill the symbols in the blank spaces*

Mrs U: Cheng, you tell the class what the written instructions mean. (This pupil was the top of the class.)

Cheng: Syllables in the sentences below lack corresponding tonal symbols. Without tonal symbols, we cannot sound the syllables out as required. We are asked to have a look at the picture above which gives us cues of what syllables are referring to. We then have to figure out what tones the syllables entail, in order to spell out the right words representing those objects involved in the pictures. We should fill tonal symbols, the second, third, and fourth, in the blank spaces.

Mrs U: Who can mark the symbols of four tones on the blackboard? Yingi, please. (She marked three symbols for the second, third and fourth tones. She said to Mrs U that she did not know the symbol of the first tone)

Mrs U: Yingi said that she did not know the symbol of the first tone. Who knows it?

Class: There is no symbol needed for the first tone.

Mrs U: That's right. We have learned that the syllable without any tonal symbol should be categorised as the first-tone unless the tonal symbol is unintentionally left out. Where should these tonal symbols be put?

Class: The blank spaces beside the syllables.

(Some of the target children who performed poorly were doing something which distracted them from Cheng's and Mrs U's explanations)

Mrs U: Let me read the written instructions for you and please listen to me carefully. (Repeated the written instructions deliberately loudly and slowly) *I can look at the picture and fill symbols in the blank spaces.* It means that you ought to look carefully at the picture and see what objects are involved. You then read the syllables below and try to sort out the tones suitable for each syllable. What will happen if I put wrong tonal symbols?

Roin: We are either unable to sound the words or we may sound it as another word if we put different tonal symbols.

Mrs U: Now, we all come to look at the picture presented above. (Some able pupils immediately spoke out what the picture meant to them.)

Liayn: There are one pupil, two horses, three cows, and four cats.

Mrs U: Don't look at your books. Now, everyone, hands back and look straight at the blackboard. Well, you see this is the first sentence of this set of exercises I copied from the workbook. Is it exactly the same as the one shown on your books?

Class: Yes. (Some able and average pupils responded loudly and others followed them)

Mrs U: (pronounced a word) Who can tell me what the word I was just saying is? Jutin, please.

Jutin: You were changing the syllable of *people* presented in the first item into another syllable. You pronounced it in the third tone. But *people* should be pronounced in the second tone if it is meant to be a man or a woman. If it was pronounced in the third tone as you put it, it would signify *patience* rather than *people*.

Mrs U: Are you saying that if I put the third tone in the blank space beside the syllable of *people*, it would not be sounded as *people* as it should be?

Jutin: No. It means patience when pronouncing it in the third tone.

Mrs U: How about the fourth tone of *people*? (selected one target pupil who had difficulty in learning phonetic symbols and asked him to sound out the fourth tone of *people*. Mrs U then asked the class for examples of the syllables sounded in the fourth tone of *people*.)

Mrs U: Leain, you give us some examples you had sorted out.

Leain: Knife, recognise, cooking, and duty.

Mrs U: There are no fourth-tone words sounded as *people*, are there?

Class: No.

Mrs U: Is it right to fill the symbol of the fourth tone in the blank space beside the syllable of *people*?

Class: No. It is wrong.

Mrs U: Now, who can tell us what you have to do with this set of exercises?

Kemin: This set is to ask us to put tonal symbols appropriate for the words representing the targeted objects in the above picture.

Mrs U: Very well, there are five items in this set. Now, which symbol is appropriate for the syllable of *people*?

Class: The second one.

Shina: (One of the top pupils in the class was asked to fill the symbol of the second tone in the blank space beside the syllable of *people*)

Mrs U: Did Shina get it right?

Class: Yes.

Mrs U: You all start thinking what you should fill in the blank spaces item by item. The blank spaces are small. Please don't make the tonal symbols too large.

(Mrs U started copying the fifth set of exercises on the board from her book while children were reading through the fourth set.)

It was clear that Mrs U's demonstrations tended to promote the pupils' understanding of the tasks by showing the relationship between the subject matter and the required operations. It seemed that the level of the pupils' understanding was enhanced through the pupils' reflections on counter-answer examples, active participation in discussions on meanings and inherent demands of the tasks in all forms and necessary rehearsals of the actual operations. The marked difference in the demonstrations of the tasks between Mrs U and other three teachers was that she led the pupils to be open to all possibilities, and to compare their appropriateness, before reaching a conclusion about the best solution to the problem presented in the scheduled tasks.

As the teachers finished demonstrating and explaining the key points of the scheduled tasks, the children were seen to move on to the start of work on their own.

#### *Transition to individual work*

It was observed that there was a quick shift from demonstrations about the tasks to children starting to get on with their work. There were far more similarities than differences between the four teachers in the instructional activity undertaken at this stage. It was found that the teachers began this final-phase of instruction by reminding the children about the inherent demands, the required operations, and those easily mistaken or ignored by the children. Both Mrs U and Mrs S were seen to be particularly ready to ask their pupils a series of questions to ensure that they had achieved the necessary levels of understanding of the tasks, to the best of their



ability if time permitted. They attempted to select two of the pupils making slow progress and to ask them questions such as *"Do you understand why we were doing this exercise in the way shown on the blackboard?, and or Well, you don't?! What do you not understand then? or "Tell me what you ought to do with this set?"*. Eventually they asked the class *"Are there any questions?"* before they told the pupils to get started. Mrs R underlined with yellow chalk on the blackboard the required operations and the standards of the results shown on the examples being done previously with yellow chalk on the blackboard. Mrs O simply pointed out the required operations one by one and stressed them as the necessary elements of the outcomes.

It was common for the teachers to mark children's work while the children were doing the work. The moment when the children started their work, Mrs U was perceived to look around and see if there were any children who got stuck immediately, or did not know where to start. She checked up in this way especially when the children were doing something new and she thought they could not do it immediately. Mrs S was seen to stress that she would be pleased to help explain the key points to those who did not understand what to do prior to the start of the individual work. Both Mrs O and Mrs R simply set about correcting children's work.

Mrs O: O.K. Everybody now get on with your work and be quiet!

(Most pupils who were doing badly just looked around, whereas those who were doing well went straight on to begin work.)

Mrs O: I am going to punish those who have not already begun their work.

(Mrs O walked out from her desk and intended to identify the pupils. Some pupils were in a great hurry to pretend they were getting on with the work and others seemed to be too indifferent to make any move. Mrs O walked towards these pupils and shouted to them.)

Mrs O: Very well. Now, everybody get on with your own work and be quiet.

Two important variables were seen to affect the focal points and effort made by the teachers throughout the instruction: the subject areas and the period. Since the teachers' demonstrations of the tasks were carried out as the main stream of the task-specific instruction, the influences of these two factors were certainly exercised more on the teachers' demonstrations than introductions to the tasks and transition

to the individual work. The language-specific demonstration was devoted more to recognition of the written scripts and the construction of the meaning of the tasks out of these written scripts. It was clearly seen that the language tasks, by and large, involved more difficult subject matter and fewer and simpler required operations, in comparison to the mathematics tasks. It frequently happened, therefore, that fewer examples, explanations, demonstrations, and opportunities to rehearse the tasks were given to the children throughout the language-specific instructional session. Conversely, as the teachers explained and the classroom observations revealed, the mathematics tasks involved far easier subject matter, but complex steps in the procedures and multiple operations. The mathematics-specific demonstration made more use of examples, discussions, rehearsals, and explanations of meanings and procedures for the required operations.

It was also found that the teachers' demonstrations were affected by the period when the tasks were presented. During the periods near the start and the end of school, the task-specific demonstrations were not comprehensively and adequately undertaken as described above. It was shown that much administrative work and routine activities took place at the start and the end of school which led the teachers to give factual information about the representations involved in the tasks and to go straight on to say what the children should do in the tasks. In the initial phase, although the children were seen to be unfamiliar with school life and classroom routine in general and school work in all forms in particular, a great deal of class time was used to carry out routine activities and school special events. The teachers explained that detailed demonstrations were not necessary for the initial units of the tasks involving easier subject matter and simpler operations. As the term came to an end, as the teachers put it, the children became familiar with classroom practices and school work in all forms, a great deal of class time was used to deal with administrative affairs, conduct paper examinations and write final reports on the children, and above all, children's abilities to learn and acquisition of knowledge and skills were fixed enough to depend far less upon the demonstrations to achieve their optimal performance. Under such circumstances, detailed demonstrations and explanations of the tasks were said to be unnecessary.

#### 7.4.2 Teacher-specific factors related to instructional practices

Post-task interviewing showed that teachers' thoughts affected the extent to which they were devoted to the above instructional activity, aimed at promoting the children's access to the tasks. It was indicated that ineffectiveness and limitations of instructional practices resulted from their lack of understanding of school-age children and their abilities to carry out instruction, the profound disadvantages of school situations, inadequacy and incompatibility of the children's established and developing abilities, and parents' lack of responsibility for the school performance of their children. All the teachers stressed the effects of these factors on almost all aspects of their professional work relating to children's learning outcomes and school performance.

As we all know perfectly well, theory-based and academically-oriented teacher education does not provide prospective teachers with the knowledge and skills specially useful and worthwhile to understand the thinking and behaviour of school-age children who are definitely different from adults. It also fails to give the training necessary to understand domain-specific knowledge and skills and special cognitive strategies for planning and implementing effective lessons. The learning programmes must be presented as meaningful and comprehensible resources which can be grasped by children quickly as required in the immediate context of classroom. Having received five years of teacher education, believe it or not, I cannot make sense of many disadvantaged pupils' ideas, performance and work which look peculiar from the point of view of an adult. They are always causing greater difficulty for me than other children. I don't actually know why they make so many mistakes or behave so badly. Without the abilities, skills and resources specially for understanding these pupils' special thinking, language skills and practical strategies accurately, I have simply to carry on teaching based on individual common sense, understanding and interpretations of the learning materials provided, and my own speculations about the causes of their difficulties from the perspective of a far more mature, experienced and knowledgeable adult. There is little doubt that optimal learning and performance of these disadvantaged pupils can hardly be achieved as long as the gap of perceiving, thinking, understanding and acting upon the subject matter and related demands between me and them remains so large. (Mrs U)

Certainly, it is very unjustified and unfair for disadvantaged pupils to move along with my lesson activity which is not conducted in terms of their ways of thinking. But I cannot help it. The whole educational system leads to this kind of unfavourable consequence. I am required to teach what is said in this uniform set of books which involves many disadvantages causing difficulty for the children learning and acting. The centralised school education, and a huge amount of teaching and

administration, make it simply impossible for me to understand the subject matter well enough to prepare the lesson activity which can match individual differences of the children at a minimum level. I have to mark a large number of notebooks of children every day and produce and fill in reports and forms related to school performance. There are 48 children in this class, but only me to handle these non-professional affairs. Honestly speaking, I spend too little time gaining real understanding of all the related factors and making appropriate teaching plans and aids which ensure the comprehensibility of the subject matter and lessons. The children are simply unfortunate victims of the consequence of doing my job as routine work, without thinking how to make it best for them. (Mrs O)

Those who do badly always run out of time and misuse their energy as a result of lack of cognitive abilities and language skills and adequate attitudes. Classroom lessons cannot be slowed down for their sake. Neither remedial teaching nor individualised tuition is available for these children. Most of their parents cannot be with them after school and supervise their homework, review learning outcomes and help prepare things necessary for the lessons next day. Most of them simply excuse themselves of irresponsibility for these unfavourable consequences by saying that they don't know how to help their children at home and their children do not take their words seriously. If they do need help on this matter, I personally think that the school should consider developing parental-involvement schemes to provide them with basic knowledge and skills. I also can give them some feasible suggestions. They have to come and discuss their difficulty with me. Even though their educational background or working conditions do not permit them to be fully involved or as helpful as expected, they must train their children to be disciplined and responsible individuals. They must show their great concern and seriousness about their children's school performance. It helps a great deal. Teachers, including me, do all we can in such self-contained large classrooms to ensure that every pupil learns and does the basic things. I deal with so many children at one time, yet the parents deal with only their own children. If they cannot be more responsible and serious about, and involved more in, their children's school education, who else can? They must recognise an unchangeable fact that the children are theirs and not the teacher's. They have got more reasons and time than I and other teachers have to prevent their children from lagging farther behind than they should. (Mrs R)

It was clear that the teachers attempted to justify the reasons why they were not in a good position to help the disadvantaged children in particular to make the best of their abilities. It was indicated that the teachers alone were not fully responsible for the children's poor performance. It was implied that something must be done in terms of teacher education, school situations, and parental involvement, in order to

improve the context in which children's optimal learning and performance could be achieved.

## 7.5 Concluding discussion

The previous chapter had demonstrated a wide range of individual differences in the children brought to school to meet the new and vast demands embodied in the lesson activity, routine practice, organisational structures, and available resources. This chapter illustrated how these children were set to perform the tasks. There were several points worthy of note.

First of all, time-tabling and coverage on the workbook entirely emphasised time, and the amount of work clearly denied and undermined the quality of experiences of performing the tasks. The imposition of the progress schedules imposed total uniformity on the completion of the amount of the tasks in a certain period of time. This not only neglected individual differences in children's abilities but also ignored the confounding effects of disadvantages of over-demanding situations and insufficient and inappropriate resources. The variations of the contents and forms of the tasks reinforced the negative effects of progress schedules on children's performance. Overall, it seemed that a combination of the shortage of time, inflexibility of progress schedules, and the poor quality of the workbook, all exacerbated the effects of the children's own disadvantages on poor performance and slow progress. Teachers attributed these unfavourable consequences to irrelevant and useless teacher education, the parents' irresponsibility for children's education and over-demanding administration and routine work at school levels.

The teachers' comments on the workbook task as a whole suggested that the children's poor performance and difficulties were related to boring, difficult, unfamiliar, inappropriate content and complex, demanding and irrelevant forms of presentation. More significantly, it was indicated that the workbook task caused hostility and an unnecessary burden for teachers and children alike. It was found that children's poor performance and difficulty occurred specifically to the content of the language tasks and the form of the mathematics tasks. As to the content of the tasks, the language tasks involving phonetic symbols were suggested to cause greater difficulty for the children than others. This meant that, for the children, almost all the tasks in phonetic symbols in all forms were hard to cope with. The

children's poor performance and difficulty in doing the mathematics tasks were suggested to be related to certain relational concepts, word problems, complex procedures and multiple operations.

Throughout instructional sessions, three activity schemes were seen to be taken to relate the tasks to children's performance: introduction, demonstration, and transition to the children's own work. Introducing the task was devoted to leading the children to find the scheduled tasks, the demonstration was used to make all necessary information and inherent demands explicit, understandable and meaningful enough for the children to start work, while the transition to the children's work was intended to remind the children about the key points and discipline, and to give the children opportunities to get help from the teachers. It was clear that the teachers' demonstration was the main stream of the instructional activity. It was commonly seen, in orientating the children to task performance, that the teachers' demonstration proceeded through six kinds of activity: (1) articulations of the written instructions or heading, (2) definitions of the integrated representations, (3) identifications of inherent demands, (4) explanations and actualisations of required operations, (5) connections between the representations, demands and actual operations, and (6) a summary of what was required for correct results. Common to these six phases of activity across the subject areas and the classrooms observed was two aspects: (1) the presentation of examples sharing the same patterns of representations, demands and required operations as those involved in the scheduled tasks and (2) feedback about children's understanding of the tasks from their responses to the results of doing the examples. The marked difference between the four teachers was in the role of the children and the way of experiencing the tasks. In the two reception classes in the suburban area, the children were found to take a very passive part in the teachers' demonstration. They were seen to be predominantly reactive. They lacked opportunities to put into practice what they had understood through the teachers' verbalisations of necessary and relevant information about the tasks. In contrast, the children in the two reception class in the central area were observed to play a more reflective and active part in the teachers' demonstration. They were seen to be given more opportunities to have direct experience of the tasks by rehearsing the required operations, discussing the meaning of the tasks and explaining inherent demands. These significant aspects were also related to the differences in the quality of the children's work, presented in the next chapter.

## CHAPTER 8

### Performance and Work of Children

#### 8.1 Introduction

The previous two chapters suggested that levels of children's performance and work were closely related to individual characteristics, instructional practices and elements of the tasks. This chapter attempts to analyse the causes of the children's difficulties and unsatisfactory work.

The framework of categories used in the previous two chapters was still relevant, since children's performance was related to individual characteristics and instructional practices as described above. In categorising children's difficulties in language and mathematics at school, three types of sources were referred to as possible ways of illustrating the nature of the difficulties encountered by children when they were getting on with tasks. The first was insights into children's learning and thinking in the early years of schooling (Donaldson, 1978, 1985, 1987; Wood, 1988). The second was theoretical formulations and the findings of the empirical studies on school language and learning to read in particular (Bryant & Bradley, 1983; Chall, 1967; Dowing & Valtin, 1984; Francis, 1982, 1985; Goodman, 1984; Henderson, 1982; Hung & Tzeng, 1981; Kenneth, 1986; McDaniel et al., 1988; Pearson, 1983; Shuy, 1984; Smith, 1971; Tzeng & Hung, 1981; Winch, 1989). The third was research into the nature of school mathematics and acquisition of mathematical concepts and arithmetical skills (Carpenter & Moser, 1983; Cockburn, 1986; Desforges & Cockburn, 1987; Dickson et al., 1984; Ginsburg, 1977, 1983; Glenn, 1977; Hughes, 1983, 1986; Resnick & Ford, 1984; Stigler & Perry, 1988; Stevenson & Lee, 1990).

Examples of children's work was selected to illustrate the reasons for their difficulty in doing that work. It was found that, in some cases, there were considerable similarities in the kinds and occurrences of difficulties across the varied kinds of work of the children. In other cases, there were distinct types of difficulties presented. The strategy adopted to sort out this kind of qualitative data was to demonstrate the similarities and differences, using quotations and written work to emphasise the main concerns.

The following presentation is divided into three main parts. The first examines the factors related to the children's performance when looking at the difficulties in doing the work. The second illustrates the characteristics of children's work. The third summarises the main findings which explained the reasons why children found it hard to perform the tasks, and discusses their implications.

## **8.2 The factors related to task performance of the children**

A combination of on-task observations and post-task interviews with children identified five direct factors which accounted for children's performance and difficulties: (1) understanding of the task instructions, (2) the subject-specific knowledge and skills, (3) cognitive functioning, (4) completion-orientated strategies and (5) motor co-ordination.

### **8.2.1 Understanding of task instructions**

To find out the reasons for the difficulties encountered by the children, it was essential to ascertain their understanding of the tasks they were to do before they started work. In attempting to explore how much the children knew about the tasks they were required to do, 28 children who were doing badly were asked what they were supposed to do. The question was *Do you know what you have to do with this set of exercises?*. The children's replies pointed to four levels of understanding related to their performance on the tasks. According to the frequency of occurrences, they were insufficient understanding, irrelevant understanding, misunderstanding, and no understanding at all.

#### *Insufficient understanding*

The most common level of understanding the children had was the one which did not provide them with sufficient information of what the tasks were all about. It was shown that the children tended to pick up the focal points of the teachers' demonstrations and explanations to get started and then to relate them to the



surface features of the tasks. The following extracts illustrate the nature of the category.

C1: This is to write.

R: What are you going to write?

C1: To write these. (pointed to the words and brackets within a statement)

R: Why do you have to write these?

C1: The teacher said.

R: Can you understand what the teacher said about writing?

C1: Just write the words down.

R: What words are you going to write?

C1: I don't know. (shrugged her shoulders and shook her head)

C7: To draw circles.

R: How do you know you have to draw the circles?

C7: The teacher drew the circles on the blackboard so I have to draw the circles on my book.

R: Do you know why the teacher drew the circles on the blackboard and you have to draw those circles on your book? Is there any difference?

C7: I don't know.

R: Can you tell me what the teacher said about drawing the circles?

C7: She said that we ought to draw the circles here.

R: But why did you have to draw the circles here and not there?

C7: Because there are numbers here.

R: What are these numbers for?

C7: I see the numbers and then draw the circles.

C3: Look at these (pointed to a series of triangles) and colour.

R: What are these?

C3: Triangles.

R: Do you know what these triangles are here for?

C3: I don't know.

R: What did you do with these triangles?

C3: Coloured them here. (pointed to the exercises)

R: How did you colour them? Did you colour them as you wished?

C3: The teacher just told us to colour them so that I simply coloured all of them.

It was indicated that the children's understanding of the tasks repeated primarily the teachers' emphasis on the action of the required operations. It appeared that the

children could hardly relate instructional information about the required operations to the integrated representations and steps in the procedures.

*Irrelevant understanding*

The children who achieved irrelevant understanding were seen to be those who tended to relate intuition to the focal points made by the teachers. It was shown that many of these children overinterpreted the required operations of the tasks and came to the conclusion entirely different from the task demands.

C4: This is to be made.

R: What is it to be made for?

C4: The teacher asked us to make it.

R: What are you going to make?

C4: Make aeroplanes, boats and houses.

R: How did you make these things?

C4: Just put them in here. (pointed to the set of make-up-sentence exercises in the book and showed the syllables given to make up the sentences.)

C4's spellings were inaccurate and incomprehensible for the most part, such as aeroplanes, boats and houses)

R: Did you think this was what your teacher told you to do before you started the work?

C4: Yes.

*Misunderstanding*

A few children were noted to mistake the similar information shown in the tasks for key points stressed by the teachers.

C10: I ought to draw circles here.

R: How did you know you have to draw the circles?

C10: The teacher said so.

R: How did you draw circles?

C10: The teacher said that we had to draw the circles according to these numbers. (pointed to the numbers marked on the corners on the left at random) Here is 3 so I drew 3 circles. (pointed to the numbers marked on the left corners 1, 2, 3, 4, 5, 6, 7, 8, which signified the items in order)

R: What do you think these numbers marked on the right corners? (They were the numbers to which the child should actually respond when drawing the circles.)

C10: They are irrelevant. I just looked at the ones on the left and drew the same numbers of circles.

Figure 8.1 shows C10's work on a set of number-circle correspondence mathematics exercises.

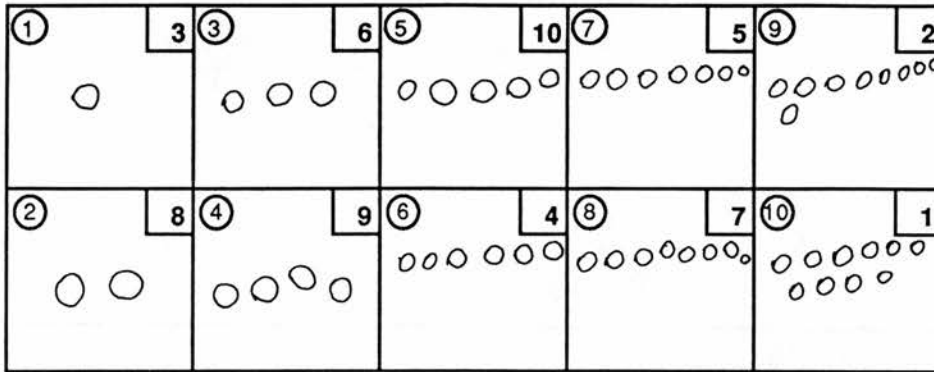


Figure 8.1 C10's work on a set of number-circle correspondence maths exercises

It was seen that some of the children could continue work although they misunderstood what to do and misinterpreted how to do it. The extracts presented so far implied that the levels of understanding of the tasks was a result of the interaction of the limited and inadequate acquisition of subject-specific knowledge and over-reliance on fragmented cues unintentionally given by the teachers. The following extract shows a pupil who had no idea of the teachers' instructions at all and could not make sense of the task prior to the start of work.

*No understanding*

It was frequently found that a minority of the children rarely gave any indication of their understanding of what to do with the tasks.

R: Did you know how to do this set of exercises before you started the work?

C6: I didn't know.

R: Did you hear what the teacher said about this set?

C6: Yes. But I did not know what she said.

R: Can you try to think hard what and how to do the work now?

C6: No. I looked at them over and over again and I just could not understand what all these meant. (pointed to the phonetic symbols, the illustrations and the layout)

R: Can you guess what it is meant to do?

C6: No. I can't.

R: Had you tried the textbook and seen if it can help you understand the tasks?

C6: I didn't even know which unit in the textbook to look at.

Understanding of task instructions was seen to act as the initial access of the children to the tasks according to the logic and operational sequences of tasks performance. But, in fact, interviewing children and teachers, and observations of instructions, suggested that the extent and scope of this kind of understanding was largely subject to the children's subject-specific knowledge and skills acquired through textbook-related instructional sessions, during which the children related their cognitive functioning and linguistic resources to the learning tasks in their own terms.

### 8.2.2 The subject-specific knowledge and skills

It was seen that, through their disadvantaged cognition, language skills and practice the children making slow progress, by and large, acquired insufficient and inaccurate knowledge and skills during the lesson sessions and applied these limited learning outcomes to do the tasks in the workbooks. There were certain domains of knowledge and skills planned as the subject matter which were found to create particular difficulty for the children.

#### *The subject of language*

As far as the subject of language was concerned, first of all, almost all of the children could recognise only frequently-occurring single phonemes and one-phoneme syllables so that they got stuck at the tasks comprised by two-phoneme and three-phoneme syllables. It was further shown that this kind of difficulty was more devastating in the case of pupils who did not have accurate ideas of four tones integrated into syllables. Consequently, these disadvantaged children were seen to have a very hard time when doing the exercise which demanded comprehension and fill-in-blank exercises which required high-order intellectual functions and linguistic processing. It was found, however, that they could handle routine practice exercises, such as handwriting.

R: Did you know what you were expected to do with this set of exercises before starting the work? (It was a set of comprehension exercises.)

C2: Read them and mark circles if they are true and put crosses if they are false.

- R: Can you read them for me?
- C2: (For "little" displayed as in the first item of the exercises) Li--, Li--(pondered for a while and shook her head)
- R: Try it again.
- C2: Li-- Li--, Li---, I don't know these two. (pointed to "tt" and "le")
- R: Can you try to read this item for me? (pointed to the second item)
- C2: (repeated the same difficulty and problems in decoding syllables. She could recognise only single phonemes. Eventually she sounded out five phonemes involved in fifteen syllables.)
- R: Did you understand this question before you marked this circle?
- C2: No. I didn't.
- R: What did you mean by this circle?
- C2: The teacher said that we should mark a circle if the description was true. I always put a circle if I do not know if it is true or false.

As far as knowledge of language was concerned, most of the children progressing slowly were perceived to be unaware of the correspondence between the written and spoken modes of a word. It was seen that they found it hard to do dictation and make-up-sentence exercises which required them to turn their spoken language deliberately into the written language. It was also noted that they did not have the command of subjects, objects, prepositions and rules within grammatical units. Many of them thought that a word was a geometric representation in isolation; a phrase contained two separate words, while a sentence meant many words put together. A few did not even know what was meant by a word. It was shown that lack of the knowledge of language disadvantaged the children more when they did the exercises such as substitution and composition.

- C8: I simply wrote down whatever I saw.
- R: What did you see then?
- C8: These words. (pointed to *piece, play, countand very well* )
- R: What did you do then?
- C8: I wrote them down.
- R: How did you do that, for example, with the first item?
- C8: I wanted to write three pieces of paper, so I wrote *three pieces* in here.
- R: Did you think that you had already written "*three pieces of paper*"?
- C8: Yes. I can read them for you. *I have three pieces of paper* (Obviously, she did not follow what she wrote. Instead, she read what she wished to express.)
- R: But do you still think it is a correct sentence if I read to you what you exactly wrote here? (The researcher then read the sentence to her, *three*)
- C8: (contemplated for a while) Yes. I wrote exactly what you read.

- R: How about the fourth item? What did you want to say?
- C8: These are *very well*. Therefore, I wanted to say *my father is very well*.
- R: Do you think you have written what you want to say here?
- C8: Yes.
- R: Would you like to read these words written here for me? (pointed to my *father*)
- C8: My father is very well. (loudly and fast)
- R: How many words do you write here?
- C8: 1, 2, two words.
- R: How many words did you speak out just now?
- C8: (read *My father is very well* and unfolded her fingers one by one at the same time), 1, 2, 3, 4, 5, five words.
- R: You meant that you said five words, didn't you?
- C: Yes.
- R: Well, how many words did you write?
- C8: Two.
- R: You write two words and read five words. Do you still think you write what you read?
- C8: (hesitated to look at her own answers) Yes.

(Figure 8.2 and 8.3 are examples which illustrate C8's lack of the awareness and knowledge of language constructs)

1. piece: I have four (three) of paper.
2. play: Everyone comes and (foot) ball.
3. count: circles
4. very well: My father

*Figure 8.2 C8's work on make-up-sentence exercises*

Your song is very nice. Please tell me what sort of song you sing.

1. Your cap is very pretty. Please tell me ( your cap ) you wear.
2. ( Song ) is very (your). Please tell me ( nice song) you (are).

*Figure 8.3 C8's work on two items of substitution exercises*

Most of the less able children also had difficulty in differentiating between words with the same sounds. It was found that they had the problems of figuring out and

using the words suitable for the context prescribed. Overall, the children were noted for their lack of awareness and knowledge of language and inadequate processing of linguistic constructions. In responding to the language tasks involving the subject-specific high-order knowledge and skills, they were seen to mix up the unknown with the known.

### *The subject of mathematics*

It was clearly shown that the less able children failed to grasp and apply certain domains of mathematics concepts and arithmetical operations to the problem-solving context prescribed. First of all, the difficulty was displayed by these children in the exercises concerned with the ordinal numbers which were formulated differently in the mathematics textbook and workbook. This puzzled those who lacked real understanding of the number relations. As shown in Figure 8.4, for each ordinal number, there were two Chinese characters between an Arabic number which signified "the" and "one" in English. However, no character was involved in representing the cardinal numbers. Almost all of the children were seen to fail to indicate the difference in the quantity between the ordinal and cardinal numbers by colouring the corresponding amounts of circles.

Before children started their work, Mrs U, focusing on children's understanding of the task, had reviewed operational definitions of the ordinal numbers by taking the class through an example. Mrs U asked seven pupils to stand up and questioned the class about how many pupils there were. She then asked the class who was in the seventh seat. The class gave Mrs U the name of the seventh pupil. Mrs U repeatedly asked how many pupils there were in the seventh, the fifth, third seats, and so on, in comparison to seven, five and three pupils altogether in row. She kept asking the same patterns of questions. It was obvious that the class was shown differences between the cardinal numbers and ordinal numbers in terms of operational definitions. She deliberately put forward a fixed idea that the ordinal number meant only *one* item of things. (extracted from field notes)

R: Would you please tell me what you did with this set of exercises?

C19: The teacher said that we ought to colour circles. So I just coloured these circles.

R: How did you know how many circles to colour?

C19: Look here. (pointed to the numeral of 5 leading the circles of the first item of this set exercises) You see, this is 5 so I coloured five circles.

R: Do you know what is meant by these two words between 5?

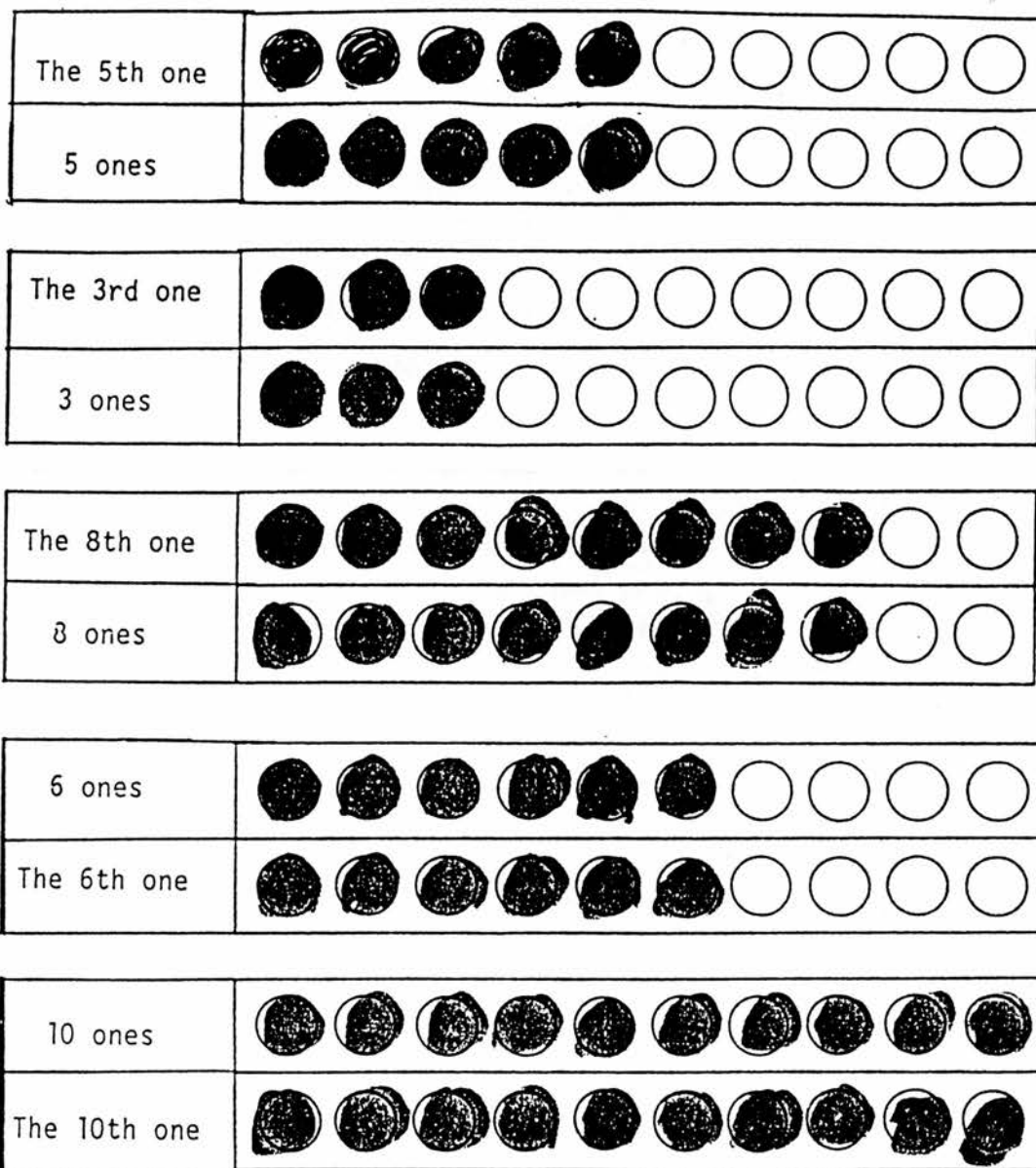


Figure 8.4 C19's work



C19: I don't know.

R: Would you like to show me which circle is the fifth one?

C19: This one. (correctly pointed to the fifth circle)

R: How about the third one?

C19: This one. (quickly pointed out)

R: Could you please point out the third circle for me?

C19: (kept silent and pointed to all initial three circles)

R: How about three circles?

C19: These. (She acted in the way exactly the same as she did with the request to third circle.)

It was also found that many children did not have accurate and clear knowledge of a "zero". They were seen to fail to do the tasks involving the "zero". Interviewing them indicated that they perceived a zero as "nothing" instead of a number. In their words, the zero represented a state of non-existence of things rather than the quantity of things brought to naught. In responding to the number of a zero involved in the exercises, they were seen to do nothing. (Figure 8.5 illustrates C9's work)

R: Would you like to tell me what you had done on this set of exercises?

C9: This asks us to count how many objects there are and then draw the same number of circles. In the first item, here is, 1, 2, 3, 4, four frogs (used her fingers counting the objects illustrated in the ellipse in the left-hand column) so here are four circles. (pointed to the rectangle in the middle column) Then I wrote "4" there. (pointed to the pentagon in the right-hand column) There are two frogs in the second item so I drew two circles here and wrote "2" over there.

R: What did you think of the third item?

C9: I did not know why this item showed nothing. So I didn't know how many circles I should draw and what I should write. (contemplated for a while and still failed to interpret the meaning of the item)

R: What did you do here? (pointed to the fifth item)

C9: Here is a zero (pointed to the number of zero) so I wrote a zero. (pointed to the zero written in the middle-column pentagon)

R: You repeated a zero?

C9: This is the "egg-like" zero. (pointed to the one marked by herself)

R: What do you mean by egg-like zero?

C9: You see, inside the symbol of a zero (pointed to the core of the number) is white exactly the same as the white surrounding of an egg. (saw the white colour in the reflection of the piece of paper to be the egg)

R: What do you have to do with all the rectangle located in the middle?

(9) Draw 「○」 and write the number


Figure 8.5 C9's work

- C9: Draw the same number of circles as those of the objects drawn in the left-hand ellipse.
- R: So you think it right to draw an egg-like zero here.
- C9: Yes. Both of them are white inside.
- R: But you just said that circles should be put in the middle, didn't you?
- C9: This item is different. Nothing is nothing. So I did not have to draw any circles. Instead, I drew a egg-like zero. What was wrong of my answer?

The concept and arithmetical operations of subtraction and the symbol "-" were also seen to cause great difficulty for almost all of the children. It was found that the children thought of subtraction as leaving things out, no more things, or disappearance of things. These notions were seen to be inapplicable to certain subtraction-based problem-solving contexts.

- C16: This is to ask you to take things out.
- R: What things do you have to take out?
- C16: This. (pointed to 5 in the statement of  $7 - 5 = ( )$ )
- R: What do you mean by *this*?
- C16: The things are not needed or wanted any more. Therefore, I have to take them out.
- R: What do you have to take out from?
- C16: All these given to me. (pointed to the equation statement)
- R: How did do you take them out?
- C16: Like this equation,  $7 - 5 = ( 7 )$ , 5 is not wanted because it comes after "-". I have to take 5 out of here. (showed the action of taking the number "5" out from the equation with her finger as if 5 was taken away so there was only 7 left)
- R: And then?
- C16: Then, I put "7" in there. (pointed to "7" inside the parenthesis)
- R: What do you mean by "-"?
- C16: This is to ask you to take the number coming after it out.
- R: Do you know what it is called?
- C16: No. I don't know.
- R: Do you know what it means by "=" ?
- C16: The answer has to be put afterwards. I took 5 out so I had got 7 left. 7 was the answer so I put 7 after "=".
- R: How about " + " ?
- C16: This is addition. Whenever I see it, I am meant to put all things or numbers together and see how many there are in total.
- R: You seemed to have a bit of difficulty in doing this set of exercises, didn't you?

C12: I didn't know what to do with them. When I saw this, (referred to the symbol "-") I knew the number following it should "vanish". And when I saw this, (referred to the symbol "=") I knew I ought to put the answer after it. But I didn't know what these meant when they were put together here.

It appeared to be widespread and noticeable that most of the children lagging farther behind found it very difficult to make up complete equation statements of subtraction by themselves. Interviewing them indicated that they were unable to size up the relations between fixed factual knowledge of subtraction, the notion of equality, number facts and the symbols of subtraction, numbers and equality. This kind of failure was seen to lead the children to have greater difficulty in writing equation statements and to be stuck at the subtraction-based tasks presented in the way the concept of subtraction was embodied in the unmatched part of two different amounts of objects.

R: Would you like to tell me how you got on with this set of exercises?

C5: I counted up five triangles and three circles set in these two rows so I put 5 and 3 and 8. (pointed to her statement " $5 + 3 = 8$ ". It apparently showed that she did not know the names of symbols of '+' and '=')

R: What do you call this? (the equation statement written by her)

C5: I don't know.

R: How did you write this then?

C5: (contemplated for some time)

R: Had you ever thought of this piece of picture before you wrote it?

C5: Yes. (then stayed silent)

R: What does this picture mean to you?

C5: There are two rows of things. I calculated how many there were altogether.

R: Do you know what these dotted lines between these two rows of things are?

C5: These are to tell you two rows of objects should be brought together.

R: How about this part? (pointed to the unmatched part)

C5: I don't know.

R: If I tell you that this item is to ask you to sort out how many more triangles there are than circles, what answer have you got?

C5: Two more.

R: Can you write a statement for it?

C5: (wrote up " $5 + 3 = 2$ ")

R: Do you know what is "+" ?

C5: To add.

R: what do you mean by  $5 + 3 = 2$  ?

C5: There are two more triangles than circles.

Two- and three-dimensional shapes was another topic causing difficulty for many children in certain sets of mathematics exercises.

C21: This is a triangle, a circle, a rectangle and a two-triangle shape. (referred to a square)

R: What makes you say so?

C21: You see, there is a top angle here (pointed to the upright angle) and the circle must be round like that. (intimated a ring along the given circles) Two sides of this rectangle are very long so it is called a rectangle. And this one... (pointed to a square)... There are two triangles together. (used his second finger drawing a line by breaking a square into two triangles)

R: So you think this shape is...

C21: It is a two-triangle shape.

R: What would you like to call it then?

C21: Triangles.

A combination of interviews with the children and observations with the teachers identified three main reasons for the children's poor performance on three-dimensional-bound tasks. Firstly, the mathematics textbook did not consist of programmes concerned with three-dimensional representations. Secondly, all the teachers were seen to give factual information about the characteristics of a two-dimensional representation whereas only the names for three-dimensional ones were given during instructional sessions. Thirdly, the children were seen to fail to perceive accurately differences in dimensional configuration between the spatial representations.

It was noted that the children possessed inaccurate and insufficient domain-specific learning outcomes which led them to have difficulties in doing the sets of exercises involving the knowledge and skills specific to those areas. However, interviewing and observations showed that the children tended to relate learning outcomes as intellectual resources to the task elements through cognitive functioning which seemed to be incompatible and irrelevant to the demands inherent in the tasks.

### 8.2.3 Cognitive functioning

Interviewing the less able children indicated that poor performance on the tasks was closely related to six dimensions of their thinking: (1) concrete thinking; (2) confounding effects of language disadvantages; (3) intuitive categorisations; (4)

over-generalisations; (5) linear associations between the factual information and actual operations; and (6) inappropriate and insufficient attention and memory.

### *Concrete thinking*

The previous chapter revealed that most of the children were unable to process information about the integrated stimuli in the abstract. It was commonly seen that, without concrete objects to work with, these children had difficulty in doing the exercises involving symbolic representations which required them to grasp their meanings and relations. It often happened that the children carried out three types of concrete manipulations helpful in dealing with the tasks involving symbolic representations: sorting out the answers by fingers, drawing things and reciting the sequence involving the information.

C24: (recited four tones of "horse", a third-tone syllable,  $\check{M}a$  and unfolded four fingers at the same time)  $Ma$  (the thumb for the first tone),  $\acute{M}a$  (the second finger for the second one),  $\check{M}a$  (the third finger for the third one) and  $\grave{M}a$  (the fourth finger for the fourth one)

R: Can you tell me what you are doing now?

C24: I am trying to figure out the tone appropriate for the word *horse*.

R: How do you know which tone the word of *horse* has got now?

C24: Just like counting 1, 2, 3, 4.  $Ma$  (sounded as the 1st tone),  $\acute{M}a$  (the 2nd one),  $\check{M}a$  (the 3rd one),  $\grave{M}a$  (the fourth one). It is the third one ( showing the third finger) sounded as the word of *horse*.

In attempting to figure out unknown or forgotten single phonemes or composite syllables involved in the language exercises, the children who adopted this kind of approach were also seen to recite thirty-seven phonemes from the first to the last in order. For example, in making sense of an English reader, it would be the case that the children who could not recognise "cat" and depended upon recitation of the relevant representations, kept sounding out twenty-six letters from A, B, C to Z. They were seen to repeatedly go through this route three times and attempted to sort out if they could catch the sounds of *c*, *a* and *t* of "cat" respectively.

Having glanced at the third item of calculating exercises,  $1 + 9 = ( )$ , C18 recited the statement and unfolded all fingers of two hands. He looked at his own hands and folded four fingers and left the thumb of his left hand upright. He then unfolded nine fingers of the right hand in response to 9. He unfolded all five fingers slowly and counted 1, 2, 3, 4, and 5 loudly. But stopped unfolding his fingers after that. He

attempted to sort out what to do next for a while. (extracted from field notes)

C18: Do you know what I should do in order to make 9 when I have only five fingers?

R: I am not quite sure what you really mean. Could you please explain it to me? (attempted to clarify how and what he had got stuck in working with his fingers)

C18: I mean that I don't have enough fingers to make 9 so I cannot work out the sum by putting all unfolded fingers of two hands together. I have to unfold nine fingers of my right hand (pointed to 9) but I have got only five fingers on my right hand. They are not enough to enable me to do  $1 + 9 = ( )$ . I don't know what to do now.

R: You drew so many circles beside these numbers. Can you tell me what these circles are for?

C17: This set of exercises ask us to select the larger one between two numbers and mark this symbol in the parenthesis underneath the larger number. I don't know which one is the larger by just looking at them. I had to draw circles to see which one had got more circles.

R: Take the first item for example. Which one is the larger? 2 or 3?

C17: 3.

R: You now know the larger one without drawing any circles, don't you?

C17: They are small numbers so I can tell you which one is the larger by looking at them. But the numbers like these (pointed to other items containing the numbers above 5) are too large to be easily compared. So I drew the circles and saw which one had got more circles.

R: For example, the second item, what do you do with the circles in order to compare 7 and 8?

C17: I drew seven circles here, 1, 2, 3, 4, 5, 6, 7. Then, I drew eight circles underneath seven circles, 1, 2, 3, 4, 5, 6, 7, 8. I arranged one circle to one circle in rows as the teacher suggested. You can see here one more left in the eight-circle row. (pointed to the end of the second row) So the number of 8 (pointed to 8) is larger and I mark this underneath 8. (Figure 8.6 shows C17's work on comparison exercises)

Please tick the space under the largest number

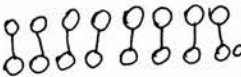
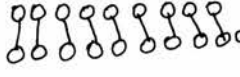
2	3	8	9	9	10
					
( )	(✓)	( )	(✓)	( )	(✓)

Figure 8.6 C17's work on comparison exercises

- C15: This is to write 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.  
 R: How did you know what you had to write?  
 C15: 1, 2, and then 3 so I put 3 after 2. (recited the numbers loudly)  
 R: How about this one? (pointed to the second parenthesis)  
 C15: 1, 2, 3,, 4, 5. Here should be 5 and thus I wrote 5 down.  
 R: You have looked at the second item for a while.  
 C15: I don't know what numbers I should put at first. (pointed to the first parenthesis)  
 R: You have got plenty of time to work it out.  
 C15: It is not right to put 1 and 2 before 6. 1, 2, 6, is just not right. It should be 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. (recited the series of numbers at small volume) I know I can put 10 here. (pointed to the last parenthesis) You see, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. (emphasised 8, 9, 10 and immediately filled "10" in)

1---2---3---4---(5)---(6)---7---(8)  
 ()---()---6---()---8---9---(10)

*Figure 8.7 C15's work on number-order exercises*

#### *Confounding effects of language disadvantages*

Most of the children were observed to be able to process factual information in isolation but they failed to grasp relational concepts which demanded high-order mental functions. Language demands involved in the concept-bound exercises were recognised as the confounding factors which overloaded the mental process of the children, and in turn, created greater difficulties. For example, most of the children found it hard to grasp the relational concepts of 'height' and 'more' in their own right. But they were seen to have more difficulties in beginning work on the language-based tasks in which the two concepts were involved.

- C23: The teacher said that I had to *Pinyin* (referred to decoding of phonetic symbols for the syllables) of every word in each item and then see if the descriptions are true or false.  
 R: Can you try to read this description to me?  
 C23: I can't read it all. I can recognise only these two syllables. (referred to "a" and "cat")  
 R: I read the description for you and then you tell me if it is true or false. 3.( ) *When a cat sits down, it is lower than when it stands up.* ) Now, can you now tell me if the description is true or false?  
 C23: (recited the theme of the same unit in the textbook) *When a cat sits down, it is higher than when it stands up.*



- R: Can you tell me if it is true that when a cat sits down, it is lower than when it stands up?
- C23: The book says that *When the cat sits down, it is higher when it stands up.*
- R: Can you read the description in here? (pointed to the item)
- C23: (recite the theme of the book)
- R: Do you think you are reading the description written in here? (pointed to the description in his workbook)
- C23: (stayed quiet)
- R: Now, can you tell me which postures of a cat shown is lower, sitting down or standing up? (showed him the target cat illustrated in the textbook, see Figure 8.8)
- C23: (contemplated for a long time, shrugged his shoulder, and shook his head) When a cat sits down, it is higher.

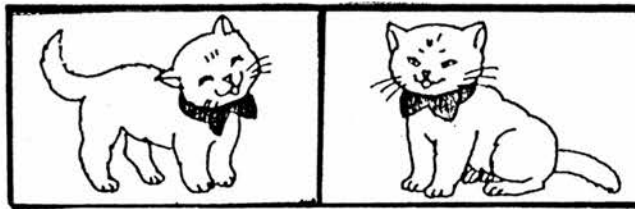


Figure 8.8 Two pictures of a cat

Mrs R, converging her instruction on routine practice aimed at helping the children to get the key points and required operations in minds. As far as word problems of addition and subtraction were concerned, she intended to read the problem statements to the class and then asked if they knew the problems should be solved by addition or subtraction operations. It was observed that most of the class failed to develop equation statements particularly subtraction ones. Mrs R selected the able children to spell out the equations directly. Then, she put them on the blackboard and stressed that they should sort out the equations as solutions to the problems.

The class as a whole seemed to understand and apply operations of addition easily. In contrast, most of the children got stuck at subtraction equations. Mrs R rushed to question the class about several word problems and asked the class to orally set out equations of addition and subtraction immediately. It was clear that the children showed their

hesitance and difficulties in working out the solutions without help of reading the statements to them. (extracted from field notes)

R: Did you know what you had to do before you started the work?

C11: To see if it is to add or subtract.

R: What does it mean to add? What does it mean to subtract?

C11: To read these words to see if it is to be added or subtracted.

R: Can you read it?

C11: No.

R: But can you not remember what Mrs. R just read to you?

C11: I forgot it all. I can recognise only these numbers in the statements.

R: Do you know what addition and subtraction mean, respectively?

C11: Addition means putting things together while subtraction means leaving unwanted things out.

R: Can you tell me what you are going to do with this item after I read statements for you?

C11: Yes.

R: It is written as *Here are three apples. There are seven more oranges than apples. How many oranges are there ?*

C11: Ten. (a very fast response)

R: How do you know there are ten oranges?

C11: Yes, I just knew it. Ten oranges.

R: Have you ever thought of three apples and seven more oranges when you got the answer of ten oranges?

C11: I know it is ten oranges straight away without needing to think of 3 apples and 7 more oranges.

R: But now, the exercises require you to write up addition or subtraction statements to show the others why you are right to say *10 oranges*. Can you write statements?

C11: No, I cannot. I don't know how to write.

R: Can you tell me how a statement of this item has got to be worked out? Is it an addition or subtraction statement?

C11: I don't know. I just know the answer is ten oranges. I don't know if it should be solved by either addition or subtraction statements.

(C11 then put down  $(3) (+) (7) = (10)$ )

R: Why and how did you put this statement?

C11: Here are 3 apples (pointed to 3) and there are 7 more oranges. (pointed to 7) There are 10 oranges. (pointed to 10)

R: Why did you put this " + " ? What is it for?

C11: It signifies addition.

- R: What makes you decide to use this symbol standing for addition?
- C11: I don't know. I always put this symbol in the statements previously.
- R: How about the second item? Can you read these descriptions? (pointed to the word problems)
- C11: No, I cannot.
- R: I shall read them to you and then you tell me how you are going to do it. *Here are five pieces of yellow paper. There are nine pieces of red paper. How many more pieces of red paper are there than pieces of yellow paper?*
- C11: Four.
- R: How do you know the answer?
- C11: I know it is four.
- R: Your teacher required you to put a statement here, either addition or subtraction one.
- C11: I don't know how to put it. I know there are four more pieces of red paper than yellow paper.
- R: What are you going to put in order to show your answer, four?

(C11 hesitated to put down  $(5)(+)(9)=(4)$ )

- R: Do you know it is an addition or subtraction statement?
- C11: I don't know.
- R: You still think you have got it right, don't you?
- C11: (stared at 10 presented in the statement of the first item described above) Yes. There are 4 more pieces of paper. 4 should be written in here. (pointed to the fourth parenthesis)
- R: But do you think it is right to say  $5 + 9 = 4$  ?
- C11: Yes. 4 should be written in here (referring to the fourth parenthesis) because there are 4 more pieces of paper.

### *Intuitive categorisations*

It was noted that many children had problems of doing the tasks which required them to classify representations into categories. It was shown that these children tended to categorise representations on the basis of immediate insight from surface features of representations without serious thinking and judgment.

- R: It is a very interesting picture, isn't it?
- C28: Yes. There are many animals in it. Rabbits, chickens, goats. Some flowers are over there. (pointed to the targeted instances in the picture when naming them)
- R: You seemed to do this set of exercises with this picture well. Would you like to tell me what you did with this set?

C28: I figured out how many of each kind of these animals there were. The animal shown first is the rabbit. (pointed to the target rabbit illustrated the picture below) So I counted 1, 2, 3, 4, 5, 6, 7, there were seven rabbits. Then I drew seven circles here. (pointed to a series of circles preceded by the example rabbit)

R: Are you sure you had already counted all rabbits in this picture?

C28: (to be certain about the accuracy, he counted the rabbits again and crossed them out one by one when counting) 1, 2, 3, 4, 5, 6, 7, seven rabbits. (counted the circles he drew) 1, 2, 3, 4, 5, 6, 7. seven rabbits and seven circles.

(C28 did not take the jumping rabbit on the far left into account. In attempting to know C28's knowledge of a rabbit, the researcher asked him about the one he did not take into account.)

R: What do you think of this one? What is it?

C28: It is a horse. A horse is running towards.

R: How about the second item?

C28: (hesitated to respond) This is a chicken (pointed to the example one) You see, 1, 2, 3, three chickens. So I drew 3 circles here, 1, 2, 3. (pointed to the circles drawn)

R: What do you think of these two animals near to the chickens?

C28: This one is little chicken and that one is a hen. Neither are chickens. This is the kind of chicken (pointed to the example one) we are bound to count. But not hens or little chickens. (after explaining to the researcher, C28 looked rather puzzled and suddenly erased all 3 circles. Eventually, he drew 4 circles instead) I think a hen is also a chicken. I should take it into account too. Am I right?

R: It is right for you to do what you think. But why do think they are the same?

C28: They both have two legs and same kind of feathers and fat bodies. (pointed to the pictures) But I don't know if this little chicken should be counted as well or not.

(C28 pondered the item for a while and decided to take that little chicken into account. He drew one more circle in the end of the row)

C28: There are now five chickens. (replied in an uncertain manner)

R: What do you mean by 2 in this item?

C28: There are two goats.

R: You found two goats in the picture, didn't you?

C28: Yes. This one and that one. (pointed to the the postures of goats were the same as that of the target one underneath the picture)

R: How about these animals near them?

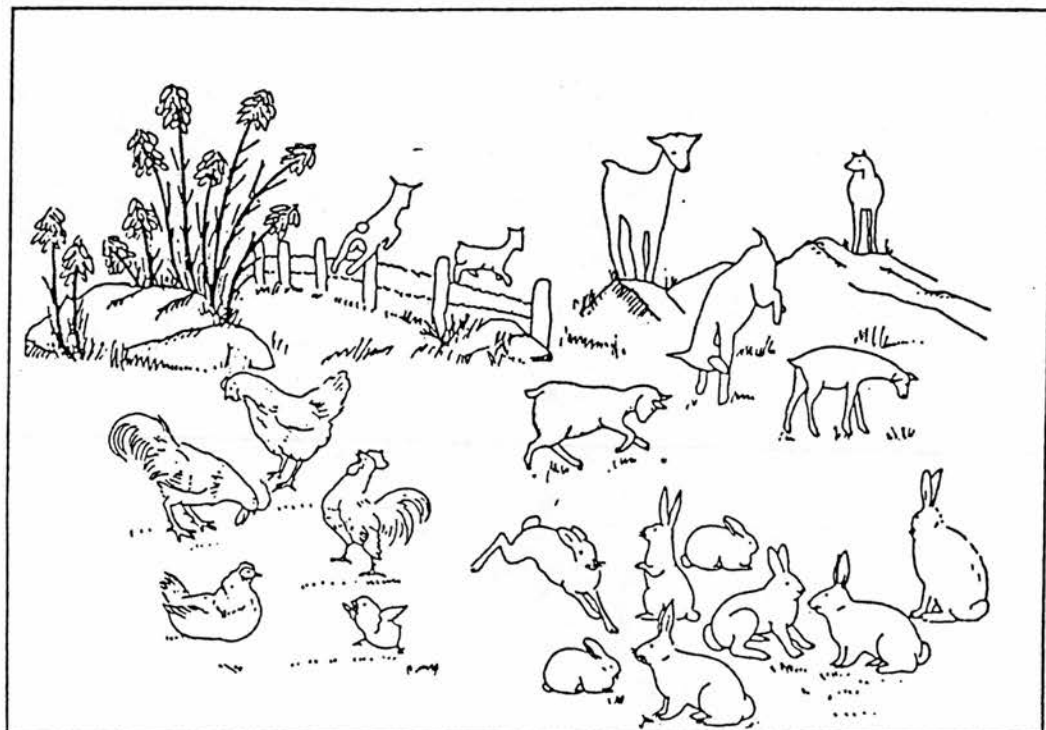
C28: They are not goats.

R: What do you think they are?

C28: They are horses. Do you not think the answer is right?

R: It is right for you to say what you think.

(6) Count and draw 「O」:











	
	
	
	

Figure 8.9 C28's work

Figure 8.9 illustrates C28's work.

### *Over-generalisations*

Most of the children were observed to apply the same reference framework to varied types of the tasks. It was found that once they thought the pieces of the information involved in the tasks were relevant, they impulsively assigned the meaning to any information familiar to them and wrote down the answers straight away. This was the factor seen to lead them to start well, but produce work full of mistakes. This occurred more frequently in the subject of mathematics than language. For example, in doing the mathematics tasks, they were seen to jump to conclusions about how the tasks were meant to be done. On-task observations suggested three aspects leading the children to over-generalisation of information about the tasks: (1) visual similarities of physical arrangements between the previous and current set of the exercises; (2) exaggeration of teachers' repetition of key points about the required operations and (3) strong impressions of prior successful experiences of similar tasks.

R: You seemed to enjoy doing this work very much. Can you tell me what this work is all about?

C26: Here are the numbers. (pointed to the numbers marked around the corners) I drew as many objects as the numbers indicate.

R: Are you certain this set of exercises require you to draw the objects?

C26: Yes, if you don't believe me, you can see the work on these two pages. (turned the workbook page backward two pages) These exercises are the same as the one I am doing now. You see, they look exactly the same, numbers marked on the corner and these squares in which the objects should be drawn. I got full marks for these two pages of work in which I just drew as many objects as the numbers represented on the corner. You see, this set of exercises are exactly the same as these two. (pointed to the physical arrangement by which the squares, numbers and the written instructions)

R: Can you read these words for me please?

C26: To draw. (decoding phonetic symbols beside three Chinese characters comprising the text)

R: Yes. But did you know what your were asked to draw?

C26: The previous tasks required me to draw whatever I wanted. So, I do the same to this set of tasks. What is it wrong with it?

R: There is nothing wrong with it. I just wonder why these circles are drawn in the first item? (drawing the corresponding circles was the accurate operations)

C26: They are balls. A pupil (referred to the hypothetical one) liked balls very much (pointed to the corner) so he drew two balls.

### *Fixed associations of the information and actual operations*

Most of the children who performed poorly were noted as acquiring domain-specific knowledge and skills through the fixed and mechanical associations of factual information and actual operations. It was seen that, without real understanding of the relationship between the integrated representations and the whole context to which the acquisition was attached, these children failed to do the work correctly. This occurred more obviously and frequently in the subject of language than mathematics.

R: Can you tell me how you knew this word should be filled in here? (pointed to the first blank space of the item)

C27: This picture shows some clouds and the sun. So, I knew it is a story of a lesson of the textbook somewhere. I turned over the pages and found it was lesson thirteen. You see, there are clouds and the sun here. (pointed to the illustrations in the textbook)

R: But how did you know the words which were appropriate for this blank space? Had you read this sentence with the blank?

C27: Here writes *It is a fine day if the sun is on the sky. It is cloudy day if there are clouds on the sky.* (read the first two lines of the theme of the thirteenth lesson of the textbook) The first two words (pointed to the item in the workbook) represent *It is* and thus the blank space which follows requires *a fine day*. I then put *a fine day* in there.

R: Can you tell me how you can recognise *This is* so quickly but cannot do so with other words?

C27: Because *This is* is written in the book but the others are not in the book.

(C27 figured out the required words by reciting the related theme of the textbook but he did not get answers right. Although the sentence identified by C27 in the theme of the textbook involved the same meaning as that of the description of the item, most of integrated words had been rearranged in the sentence presented in this item.)

R: Can you read the complete sentence involving the words you just filled in the blank spaces?

C27: It is a fine day when it is cloudless (only *it is* were accurately read and the answers needed to fill in the first blank space.)

### *Inappropriate attention and memory*

Three phenomena were seen to reflect the characteristics of the children's attention to the tasks. Firstly, it was noted that most of the children's attention shifted from the pictures to the numbers and then to the text. More specifically, no sooner had the children looked at the illustrations or the pictorial objects than they ignored the

more relevant and critical elements presented in other modes. It was noted that the children's perceptions and interpretations depended upon the pictorial objects and illustrations. These children were seen to pay attention to the representation in detail. It was found that these children were not used to paying attention to the wholeness of a representation and a context to which the meanings of written scripts, pictorial objects, illustrations and layout were attached. It also occurred frequently that they were attracted more by the centrally-located and larger representations. This was especially seen in the situation in which they were calculating various kinds of objects in the mathematics tasks. It was found that they tended to count the ones located in the centre and ignore the small-size ones at the edge of the page.

Most of the children failed to retain relevant information long enough to accomplish the tasks. It was also seen that they did not make sufficient effort to remember academic matters in particular. Interviewing them indicated that the parts these children remembered best were the most frequently repeated, and also the last bit of information given to them just before they started doing the work, i.e. the effects of frequent occurrences and the proximity of the stimuli. However, as interviewing the children suggested, completion-oriented strategies were adopted to avoid being deprived of the opportunity to enjoy themselves in the break. All teachers required the children to continue any unfinished work in the break to the best of their abilities.

#### **8.2.4 Completion-oriented strategies**

A set of completion-oriented strategies were seen to be used by most of the children who had many disadvantages as described above in doing the tasks. It was found that they took practical measures to work out required solutions to the problems after relating existing knowledge and understanding of focal points of the teachers' instruction to relevant information incorporated in the tasks. A combination of observations and interviews with these children identified three types of strategies widely used by the children who were doing badly: (1) copying from whatever was available; (2) self-assured manipulations; and (3) guessing the answers.



## *Copying*

Copying the answers was seen to be a popular approach to the completion of the tasks. On-task observations identified three sources of copying answers: (1) the results of examples carried out on the blackboard during teachers' instruction; (2) the answers of other classmates; and (3) the content of the textbooks. It was indicated that common to the conditions of referring to these three sources was little understanding of the tasks, greater difficulty of the tasks, insufficient subject-specific knowledge and skills, and above all, lack of any motivational orientation for engagement with the work.

R: Could you tell me how you did it?

C20: Copied it from the examples shown on the blackboard.

R: Did you know how it was done before the start of work?

C20: I didn't know.

R: Why did you write them on your book then?

C20: They were the teacher's answers. Thus, they should be correct.

R: Are they the same problems?

C20: I am afraid that I cannot tell whether they are different or the same. The teacher did that way, so I did.

It was noted that many children copying from the examples on the blackboard did not try to size up the differences in the instances between the examples and the workbook tasks. It was found that most of them did not care whether or not the answers copied from the blackboard were appropriate for the exercises in hand. The work of classmates was shown to be another source of the answers required. The children who copied others' work were perceived to be those who attempted to get the work completed as soon as possible regardless of the accuracy and appropriateness of the results.

R: Could you please tell me how you did this set of exercises?

C18: They all did so. (pointed to the pupils around him)

R: Do you know why they all did that?

C18: I don't know. They did that and so did I, anyway.

R: Have you ever tried to find the answers on your own?

C18: I do not know what to do. So, it is better to write what others write than not to do the tasks at all.

As on-task observations revealed, there were two unexpected consequences of copying other children's work in the short run: (1) copying the answers inadequately; (2) copying the right answers but putting them in the wrong places. A few withdrawn, shy but disciplined children who made slow progress were seen to refer to the textbook which contained the same thematic matter as that involved in the same unit in the workbook. This approach was taken more frequently in the language tasks. Nevertheless, observations of this kind of child suggested that their inadequate knowledge of language and coding skills led them to have difficulty in identifying the themes of the textbook suitable for the exercises. A few of them did not even know how to refer to the textbooks and they turned over the pages of their textbooks aimlessly without knowing where to stop. Copying the answer from the textbook was rarely seen in the subject of mathematics.

#### *Self-assured manipulations*

A few children were seen to gain insight into the context of the task. It was noted that, in sorting out the solution to the problem, these children manipulated the context based on the relationship between the insight and task demands.

R: Could you please tell me how you did with this set of exercises?

C13: We are asked to draw lines between the example shapes and the objects presented in the same shapes. This ruler is shaped like a triangle so I drew a line between it and the example triangle. This ball is shaped like a circle so I drew a line between it and the example circle. This flag is shaped like this example shape so I drew a line between both of them. (Obviously, C 13 did not know a square so he could not use the term.) This envelope is shaped like a rectangle so I drew a line between it and this example rectangle.

R: How did you know they were the same shapes? You thought they were looked exactly the same, didn't you?

C13: The top of this ruler is downwards while that of the example one is upwards. I have to turn the book in this way. (turned his book towards angle of forty-five degree in order to show that the flag was shaped exactly the same as the example square) I also found that this envelope looked like this example rectangle when I turned my book around like that. (turned his mathematics workbook towards ninety-degree angle)

R: Would these objects remain in the shape of a triangle, a square and a rectangle if you did not turn your book in the direction as you just described?

C13: No. They would be shaped differently if I did not turn my book around.

### *Guessing*

Two types of the children were seen to be inclined to guess the answers. One was those who did not even try to adopt the above strategies for the completion of the work. The other one was those who did not think those completion-oriented strategies suitable for certain types of the tasks.

R: You seemed to be doing well with your work, don't you? How did you come to these answers?

C25: I simply guessed the answers from what I already knew.

R: Well, it is not easy to guess, if you don't know something about the tasks, isn't it?

C25: Can't you guess? It is very simple. Like this set, there are two numbers and she said that I had to mark the larger one. (referred to the neighbouring classmate) I just guessed. This is 5 but I didn't know this (pointed to 6). I guessed 5 and I then marked 5 here.

It was clear that most of the children had their own ideas, explanations, interpretations and justifications for initiating and actualising their thinking and operations relevant to particular demands and contexts of the tasks. More specifically, their performance was primarily based on the imposing of meaning on the tasks through means of recognition of the relationship between their learning outcomes specific to the subject matter and the components of the tasks. Since all the workbook tasks had to be produced in written form, motor control was seen to be related to the children's performance to an obvious extent.

#### **8.2.5 Motor control**

Children of average ability got on with the written work with strenuous effort but some discomfort. It was seen that most of the children doing poorly lagged farther behind, partly because they spent more time in overcoming difficulties in controlling their pencils, rubbers and rulers. Most of these children could not hold their pencils correctly, nor could they write many answers in a short time. It was found that they had special difficulty in managing to write the Chinese characters of which the number of integrated strokes of a word could be as high as 30. The children were perceived to use up more space to write the words than was allowed. This resulted in their written work being too squashed up to be read and understood. Their language work in Chinese characters was generally filled with messy, crowded, incomprehensible, unbalanced, and incomplete arrangements of

strokes. It was found that the left-handed children who were forced to use their right hands had tremendous difficulty in writing the answers. Most of them were found to produce examples of mirror writing. Naturally, these particular children spent more time producing poorer work in comparison to the right-handed children of similar abilities.

As we have seen, the interaction of these individual disadvantages with the task demands resulted in poor performance and difficulties in doing the work. The following analysis looks at the overall outcomes of the children's work.

### **8.3 Children's work**

Three features were categorised as being indicators of the children's poor performance and slow progress: the problem, the error, and the score.

#### **8.3.1 Problems**

The problems shown in the children's work were the objective indications of difficulties encountered by the children. It was noted that some problems suggested clear-cut difficulties, while others indicated complicated difficulties. For instance, in responding to the language exercises, like handwriting practice of the words, the children exhibited explicit and identifiable problems which represented a combination of inadequate perceptual discrimination and poor motor coordination. Such clear-cut problems were also found in the children's work on the mathematics tasks, for example, in handwriting practice of numbers and object-number correspondence. In contrast, there were confounding problems arising from the language and mathematics tasks which involved greater difficulty in the subject matter, multiple inherent demands, multiple-step procedures and unfamiliar components contained in the layout. In the language tasks, the children's confounding problems were often in tasks such as make-up-sentence, tell-the-story, fill-in-blank, and composition. The problems took the form of inaccurate words, meaningless statements and incomprehensible presentation. In the case of mathematics, the confounding problems were displayed in the tasks of the word problems of addition and subtraction in particular. The problems took the form of the unreasonable equations which indicated a confusion of numbers in relation to symbols of addition, subtraction and equality. The above analysis of the children's

problems as a whole illustrates the children's difficulties at a superficial level, whereas the presentation of the errors that follows indicates the specific causes of children's difficulties in doing the work.

### 8.3.2 Errors

Four contrasting domains of errors were identified from the children's work: (1) individual- vs context-based errors, (2) systematic vs unsystematic errors, (3) consistent vs inconsistent errors, (4) comprehensible vs incomprehensible errors.

It was clear that the errors could suggest whether the main causes for the children's difficulties were individual-based or context-based. More specifically, the errors caused mainly by the individual disadvantages were found in the children's work made in the task-specific conditions: (1) the lesser difficulty of subject-specific knowledge and skills, (2) single demands, simple steps in procedures and familiar actual operations involved in the tasks and (3) the teachers' sufficient demonstrations and comprehensible explanations about the tasks. Conversely speaking, the errors caused primarily by the contextual disadvantages were found in the children's work in the conditions of (1) the greater difficulty of subject-specific knowledge and skills needed to do the tasks, (2) multiple demands, multiple procedural steps and complex operations incorporated into the tasks and (3) insufficient demonstrations and inappropriate explanations about the tasks.

It was also noted that there were logical sequences reflected in the children's errors. These could be understood by means of an analysis of the relationship between the properties of the errors and the hierarchy of the knowledge and skill domains involved in the tasks. As the tasks moved upward in the hierarchy, the higher the subject-specific knowledge and skills were, the greater difficulty facing the children and the more errors that were made. This kind of error was systematically made in contrast to the errors made as a result of carelessness, impulse, and completion-oriented actions.

The children also made the same errors repeatedly, even when they had been corrected. This kind of consistent mistake was reinforced by (1) children's fixed mechanism of associating stimuli with responses, (2) their successful previous experiences with the similar tasks and (3) lack of sensible reflection on the teacher's corrections. But some special errors suggested that the children did not necessarily

make the same mistakes on exercises which involved the same kinds of demands. It was not surprising to see some of the children's workbooks containing consistent and inconsistent errors at random due to their on-the-spot emotional and psychological reactions to the tasks and motivational orientations.

Some of the children's errors could be recognised and understood on the surface at first sight, while others had to be explored with a great deal of effort. The children made some errors in certain tasks which simply did not make any sense at all. This kind of incomprehensible error occurred more frequently in the tasks in phonetic symbols which required high-order knowledge and skills of language. Many children were not able to explain what they meant in the errors they produced when doing the tasks of make-up-sentence, substitution and composition in particular. These errors failed to provide any cues of specific difficulties encountered by the children. The errors made on the mathematics tasks were much more comprehensible. To a large extent, the mistakes could be generally understood straight away without further probing. The errors act as ways of qualitative sources of understanding the children's difficulties, whereas the scores given by the teachers act as quantitative indices of the children's overall performance and progress.

### 8.3.3 Scores

It was seen that scoring of all kinds of the children's work was done by the class teachers themselves. More specifically, they each decided the points a correct answer could merit for themselves. Interviewing the teachers and analysis of the children's scores suggested that there were neither reasons nor principles on which the teachers' scoring systems were based. By and large, as the teachers revealed, for the convenience of finishing marking all kinds of children's work as quickly as they could, they counted the approximate number of accurate answers first and then put the marks which were from two to five times of the number of the accurate answers. A close examination of the relationship between the children's work and the corresponding scores indicated the decisive effects of the difficulty of the tasks and the period of time allocated to the children's work on the proportion of the accurate results. Overall, the children got far higher scores in mathematics than in language. According to the scoring systems universally used in the formal paper examination in Taiwan, full marks were 100 points while 0 point was given to the children who

did nothing. Marks below 60 implied that the children were backward and performed poorly. Generally speaking, in the mathematics tasks, most of the children who made slow progress could get two thirds of the results right and gained 70 points due to a large proportion of tasks involving low-order knowledge and skills. It was generally found that the children having high scores in the mathematics tasks got no more than 20 or 30 points on the language work in phonetic symbols at most. In contrast, the results of the language work in the Chinese characters were rated from 50 to 60 for such children.

Since there is no such thing as remedial teaching, far less 'retention', throughout compulsory education in Taiwan, even the least able children who learned little and completed almost nothing at the end of the school year, still moved upwards one level on the education ladder.

#### 8.4 Concluding discussion

Five categories of children's qualities identified in chapter 6 suggested the prerequisites for having a good start in school and making progress. Although children's work had been used to help in inducing thoughts of the teachers and parents, their viewpoints and explanations led the identification of children's qualities to be an interpretive generality, rather than descriptive specification of the integrated properties of children's qualities. Interviewing teachers and parents showed that both groups tended to hold on to non-reflective thinking on the issues closely related to themselves, clear-cut and linear cause-effect interpretations, and fixed and simplified reference to the children. Five categories of children's qualities identified in this chapter illustrated individual-, object- and context-dependence of task performance and difficulties.

As we have seen, the logical sequence of children doing the work indicated the profound effects of their understanding of the task instructions. It was found that understanding of the task instructions was concerned with *what to do* as a result of catching the teachers' repeatedly stressed points about the required operations. A combination of interviews and observations with the children suggested that the four levels of understanding - insufficient, irrelevant, inaccurate, and no understanding - were not determined just by the teacher's task-specific instruction. In fact, an analysis of the content of children's work, combined with interviewing,

indicated the paramount importance of cognitive ability and the pervasive significance of language skills. It was shown that the children's cognitive functioning and their limited acquisition of subject-specific knowledge and skills, affected their understanding which in turn led the children to interpret the tasks in their own terms. The children's inaccurate outcomes in certain aspects seemed to indicate effects of domain-specific knowledge and skills which were greater than the children could reach. It was shown that the children found it much harder to cope with tasks which demanded of them knowledge of language with special reference to grammatical units, the relations of language constructs and coding skills, and paying special attention to phonetic symbols. The children were also seen to have more difficulties in embarking on the tasks which involved concepts and arithmetical operations concerned with subtraction, relational conceptions of the ordinal and cardinal numbers, and those of two- and three-dimensional spatial representations. Sufficient evidence indicated that the incompatibility between task demands and the children's thinking specifically resulted from fixed stimulus-response associations, over-reliance on the concrete manipulations, overgeneralisations of information and actual operations, and intuitive categorisations. Language deficits obviously disadvantaged the children when processing information for comprehension.

By and large, like the teachers, the children were perceived to be intent on the completion of the scheduled work on time. It was suggested, for the children, that completion-orientated strategies saved them from continuing to do the work in their breaks. Children who used to copy or guess the answers aimlessly did not believe that they could improve the quality of their work or develop any real understanding of the tasks. Those who took self-evident monitoring measures to complete the tasks showed more their practical insight into the contextual information which were based on limited knowledge, skills and understanding of the tasks. Most of the children who were seen to have difficulty in producing good quality written work had insufficient motor control to write the numerous strokes required for all kinds of Chinese characters.

The children's work provided qualitative and quantitative evidence of overall progress. Three objective indices were found to show slow progress and backwardness: the type of problem, the errors made and the score obtained. The difference in the properties of these three measures suggested that the problem



indicated what was wrong with the results, the error provided specific reasons for why and how the results went wrong, and the score indicated how bad the results in a general way. A combination of interviewing, observations, and analysis of problems and errors, confirmed and elaborated the previous finding on the effects of the disadvantages of the children, the tasks and the teachers' instructions on the children's performance. However, due to attempts to show the significance and importance of similarities and differences and complementarity of varying data sources, the presentation and discussion made so far cannot provide clear and firm indications of the interaction between these three domains on the effects on the performance and progress of the children. The next chapter will present four case studies, in an attempt to illustrate holistically these three domains on the effects on the children's performance.

## CHAPTER 9

### The Case Studies

#### 9.1 Introduction

The case studies presented in this chapter illustrate the effects of the interaction of influential factors which had been identified in Chapters 6, 7, and 8. The discussion on the cases will lead to the implications for reception class teaching in Taiwan made in the next chapter.

Of related methodological discussion of the case study approach to research, the points made by Lincoln and Guba (1985) are more relevant to the present study than others. They outline the strength and necessity of the case study in the qualitative mode. It is argued that the case study is 'the primary vehicle for emic inquiry - the naturalistic inquirer tends toward a reconstruction of the respondents' constructions (emic) while the positivistic inquirer tends toward a construction they bring to the inquiry a priori (etic).'(p. 359)

Following their suggestions about the case study, there are five methodological purposes for presenting case studies in this chapter. First, they provide holistic and lifelike descriptions for the reader of the way events actually take place in the classroom. Second, they provide the reader with access to examining the extent of the bias of the researcher through the revelations of reciprocal relations and mutual actions between the researcher and the subjects. Third, they provide the reader with an opportunity to search for internal consistency. The case studies involve a large degree of freedom in obtaining a newly-established piece of information and this in turn paves the way for the examination of interpretations of the raw data and their internal consistency. Fourth, they produce the full descriptions necessary for judgments on transferability of the findings. Finally, they provide grounded examinations of the context under study, which are important since the phenomena actually largely depend for their existence and meaning on the context in which they occur. Under the circumstances, the reader needs a sufficiently realistic and illustrative picture of what the context is like. Methodologically speaking, the case studies that follow are intended to function as a means for sharing contextual information in the special setting of Taiwan reception classes under study.

Nevertheless, the more specifically practical aim of presenting the case studies is to show firmer and clearer indications of children's difficulty in performing tasks from the perspective of the interplay of the influences identified in the previous chapters. In achieving this special aim, certain preliminary considerations and actions were taken as follows.

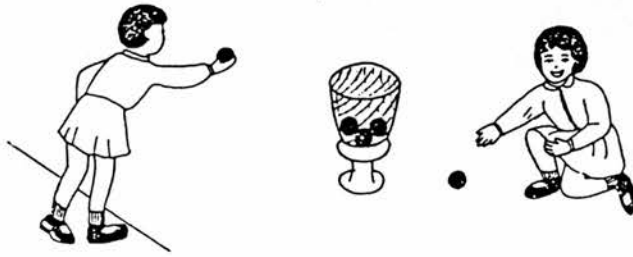
First, since the inadequacy of the task elements had been identified as one of the main causes of children's difficulty in doing the work, there was a need to present the cases which could best illustrate the effects of these task elements. As far as the intelligibility and accuracy of the presentation and description of the tasks was concerned, it was decided to select the mathematics tasks as the targeted objects on which the children's performance were reflected. In avoiding the confounding effects of a larger amount of school routine activity and administration imposing upon both the teachers and children at the start and end of school, it was decided to select the tasks scheduled in the middle of the semester. More significantly, to highlight the profound disadvantage of the tasks more firmly and clearly, it was necessary to select the tasks which caused more unnecessary difficulty for the children. Following these two considerations, it was finally decided that the cases presented would be the first two sets of mathematics exercises in the fifth unit. There were two particular reasons for choosing these two sets. First, they were arranged consecutively in the same unit. This meant that they shared the same domain of knowledge and skills, cognitive objectives and the demands for intellectual resources but varied in the representations, the required operations, the steps of procedures, and the layout. Therefore, the effects of the task elements on the teachers' and children's performance can be illustrated more clearly. Second, there was a strong consensus among all the teachers that the children had greater difficulty in doing these two sets than they should have, in terms of the relevance of the children's acquisition of related knowledge and skills to the demands inherent in the exercises.

In attempting to emphasise the effects of instructional practices, it was necessary to show the contrasting results made by two children with similar characteristics and qualities in responding to the learning programmes and instruction. To select the children whose similar qualities could help make the observed effects of differences in instructional practices explicit and convincing, it was decided to select two children from the classes of two teachers, Mrs O and Mrs U, who were markedly

different in many significant aspects of the task-specific instruction described in Chapter 7. Finally, to stress the effects of the children's individualities, it was decided to select two target children from Mrs U's class. The reasons were not only because they received the same treatments in the tasks, so that the comparison could be convincingly made. It was also because the encouraging effectiveness of Mrs U's instruction could demonstrate clearly the effects of the children's qualities on the performance and results.

These two sets of exercises were set in the fifth out of ten units of workbook tasks in total. The previous four units of tasks were concerned with one-to-one correspondence of concrete and semi-concrete objects and symbols, the numbers to 10, the larger and smaller numbers, the cardinal and ordinal numbers and sums. The following three units were related to arithmetical operations of addition and subtraction, recognition of numbers from 11 to 20, and time. The children's proximate experience of the mathematics tasks was doing the sums in the fourth unit prior to the start of the fifth unit specially analysed in this chapter. Throughout the session of doing the fourth unit, the children in the main counted objects which were shaped into four types of geometric representations, drawing the same number of circles indicating the quantity of each type of representations and writing the correspondent numbers.

The two sets of exercises comprised of ten items altogether (see Figure 9.1). They were aimed at consolidating learning outcomes concerned with the relationship between whole and part of a number through responses to the relevant contexts in which the integrated elements were formulated differently. The first set showed the children the information resources, which took the form of concrete representations (balls and baskets), corresponding semi-concrete representations (circles), and the pictures. In contrast, the second set presented semi-concrete representations (circles) and symbolic representations (numbers) to the children. The numbers prescribed to be dealt with were 5 in the first set and 6 in the second. The first items in the two sets illustrated the required operations clearly and completely, which the these children had to carry out these in the remaining items.



(1) Colour and group: How many are there thrown in and not thrown in the basket respectively? Put them in a circle.

① Ming

② Ying

③ Chan

④ Mein

⑤ Moo

⑥ Chun

(refer to page 33 in the textbook)

(2) What and what makes 6? Draw and fill in.

①

②

③

④

Figure 9.1 Two sets of exercises in the fifth unit

## 9.2 Two interactions with the first set of exercises

### 9.2.1 The background information

#### *The first set of exercises*

The first set of exercises showed the children written instructions, the names of imaginary child players involved in the background story, five balls, one basket and five circles representing five balls in the semi-concrete terms. This set of exercises was specifically aimed at the mastery of learning the relational concept and the operations of the number of 5 and its two parts. According to a combination of an analysis of the task elements and interviewing the teachers, in making optimal progress and accurate results, the children had to meet five underlying demands: (1) grasping the relationships between teachers' spoken language, the written instructions and representations, including concrete and semi-concrete objects; (2) inducing factual knowledge of 5 and applying counting skills; (3) establishing associations between the concrete objects, semi-concrete objects, and the contextual story of a throwing-ball game; (4) inferring a frame of reference for grouping the two types of representations into two sets; and (5) carrying out three operations which demanded motor co-ordination in terms of the correspondence between the representations, with a frame of reference for grouping the representations into two sets and three required operations. Both Mrs O and Mrs U indicated that the difficulty in doing this work lay mainly in the multiple demands for actual operations. It was said that the children's knowledge and skills relating to the relational concept of whole and part of a number were unnecessarily complicated by the multiplicity and within-step interferences of the required actions upon the representations. The following presentation of the children's background information was based on a combination of interviewing the parents and the teachers and classroom observations.

#### *The two children with similar characteristics*

These two children came from dialect-speaking families but their parents had communicable command of the officially spoken language - Mandarin. At home, their parents provided them with some readers and commercial products to

promote literacy and numeracy. However, in fact, they did not learn much through these materials, due to a lack of adults' guidance at home. More significantly, they seemed to show little verbal aptitude. Since they started to speak, the main sources of experiencing language matter and developing related facilities in language were their interactions with elderly grandparents and TV programmes. Their vocabulary was concerned more with self-bound everyday events, the real objects encountered frequently, and human relations. They could not respond to the teachers in complete sentences. They used adjectives, verbs, nouns and pronouns to meet the teachers' demands for descriptions. More specifically, they enjoyed themselves moving about the classroom and liked to use physical movements to show what they tried to say. Both of them showed their boredom and impatience when being required to sit still and listen to continuous classroom discourses. They hardly made any effort to think, engage or respond to the targeted objects and activity, unless they foresaw rewards for the results. Their thinking was noted to be more spontaneous, intuitive, fragmented and mixed-up than the more successful children, and their actions were poorly organised and disorderly.

Before starting school, they went to private kindergartens where they received preparatory education. It meant that prior to the start of school they had learned to read and practised handwriting of phonetic symbols and Chinese characters, and also knew the names of numbers and basic arithmetical operations of addition, which were the thematic matter of curriculum implemented in the reception class. The two children were born left-handed but both of them had been forced to use right hands since starting to learn to use chopsticks. It was noted that they spent more time doing the written work and produced incomprehensible, unfinished and mirror-writing results. As a consequence, they had very strong resentment against activities which required them to use their hands. They had special difficulty in holding pencils, crayons, scissors, knives and other equipment. They both liked to scribble everywhere, especially in books. It was said that both of them disliked engaging in handcraft and drawing activity in the kindergarten. They were described as disliking the language work and paying no attention to language lessons in the kindergartens. In contrast, they enjoyed learning mathematical matter and they always completed mathematics tasks on time as required in kindergartens. They were said to be too restless to settle down to work. In the kindergartens, it often happened that they were easily distracted, made strange and loud noises and ran about in the classrooms for fun.

The above characteristics were seen to continue in the classes of Mrs. O and Mrs. U. Both of the children had been punished for their disturbing behaviour, daydreaming and playing with irrelevant things underneath the drawers throughout lesson sessions. They frequently brought the wrong materials to school. Their learning outcomes were characterised by limited and fragmented facts and routine operations. They had difficulty in acquiring high-order knowledge and skills due to cognitive and language inefficiency. A combination of interviewing, observations and analyses of their work on the previous four units of tasks showed that they could recognise and produce numbers up to 10, and could do one-to-one correspondence between concrete objects, symbols, sums, and could identify the larger numbers. They both lacked the knowledge of ordinal numbers and failed to distinguish the cardinal and ordinal numbers at the operational levels. They also lacked understanding of number relations. Nevertheless, their work was of a different quality.

#### *Mrs O and Mrs U*

There were marked differences between Mrs O and Mrs U in two important aspects of instructional practice which affected the children's performance to a significant extent. First, Mrs O spent approximately one quarter of the period of time presenting the scheduled tasks to her pupils who were given three quarters to do the work. It was explained that disadvantaged pupils could not take on all of what had been demonstrated and explained throughout instructional sessions due to their inabilities. Their learning outcomes and understanding of the tasks were said to be too limited to complete the work accurately, regardless of the period of time the teacher's instruction took. Mrs O thought that the pupils should be given sufficient time to relate limited learning outcomes and understanding to the demands inherent in the existing tasks in order to find the best solutions to the problems provided on their own. It was indicated that there was little that the teacher's instruction could do for these less able pupils. Mrs O stressed that the pupils' minds, rather than her instruction, was responsible for the task performance. In contrast, Mrs U spent three quarters of the period implementing the tasks, introducing, demonstrating, explaining and providing the opportunities to rehearse the required actions upon the tasks. Mrs U believed that the more demonstrations, explanations and rehearsals were made, the better and more adequate the pupils'



understanding of the tasks was, the more optimal the pupils' performance would be.

Second, Mrs O gave her pupils the impression that she did not mean what she said, because she hardly ever insisted on her expectations and requirements for the pupils as a whole. It was noted that Mrs O often accepted the pupils' incomplete work or irresponsibility. Mrs O frequently forgot to proceed to what was set to be done with the pupils, and she seldom checked up on the pupils' engagement with the scheduled activity or work. It was seen that her pupils did not take part in the work seriously since they learned that they could avoid it, because of Mrs O's lack of insistence on her requirements. In Mrs O's class, there were more pupils, than those in any other class under study, who did not concentrate on the lessons, did far worse than they should, produced incomprehensible and incomplete work and were badly disciplined. In contrast, Mrs U was found to show her pupils that she was serious about every word and action she made. She had unusual energy, determination and a specially good memory which enabled her to do everything she could to ensure that her requirements and expectations were met by the pupils. Her solemn facial expression and bullying made her pupils frightened enough to take her demands seriously. Understandably, in comparison to the other classes observed, Mrs U's class had the fewest pupils who forgot to bring things necessary for lessons, paid no attention to instruction, produced unfinished work, or were undisciplined. The following section presents the instructions given by Mrs O and Mrs U for the first set of exercises in the fifth unit of mathematics tasks.

### 9.2.2 Classroom instruction about the first set of exercises

#### *Mrs O's instruction*

In two periods on Tuesday morning, Mrs O completed her instruction for the first and second sets of exercises in the fifth unit in twenty minutes. As soon as the lesson had begun, Mrs O told the pupils to turn to the pages where the fifth unit of tasks was located. Having observed the pupils looking for their mathematics workbooks for a while, Mrs O went straight on to identify the representations shown on the exercises for her pupils. Mrs O stated that, in each item, the pupils would find a name of an imaginary child player, five balls, a basket acting as a container, and the picture showing the results of the child throwing the ball in the

basket. Having asked the class to count the balls available for play in total, Mrs. O drew her pupils' attention to three different operations illustrated in the first item of this set of exercises, i.e. colouring four circles and crossing out one circle underneath the basket and putting circles in bigger circles. Without giving any explanation of what these operations meant, Mrs. O stressed to the class that four coloured circles represented balls thrown in the basket and one crossed circle signified that it was not in the basket. She went on to draw the first item on the blackboard quickly. She then demonstrated the three required actions, and her pupils were asked to watch her doing them carefully. She carried out the operations and verbalised the actions, while all pupils had to take notice at the same time. First, she counted the balls thrown in the basket, and the class recited 1, 2, 3, and 4 at the same time. She then coloured four circles underneath the basket in red and the class recited 1, 2, 3, and 4 all together. Second, Mrs. O counted the balls not in the basket, and the class recited 1 all together. She then crossed out one circle underneath the basket in red, and the class recited 1. Third, Mrs. O put four coloured circles in a big circle and one crossed circle in another big circle. When she had finished the demonstrations, Mrs. O emphasised that every pupil had to produce the outcomes which involved these three required operations. The class was then told to start work on the second item because the first item had been done by an imaginary child.

It was clear that Mrs. O was quick to set up the linear correspondence between the two kinds of representations and three required operations without giving any explanation of what these elements meant. Mrs. O believed that her pupils' understanding of the tasks necessary for accomplishment of the tasks could be achieved by listening to her descriptions of the representations and processes of the required operations. Mrs. O pointed out, specifically, that the disadvantaged pupils needed only factual information about the representations and required actions made as clearly as they were shown on the exercises. Under the circumstances, these pupils were thought to have exact, clear-cut and simple ideas which enabled them to respond to the representations and demands inherent in the tasks immediately and accurately as a result of the clear linear correspondence between the necessary information and actions. It was thought that these pupils' limited knowledge and skills related to the tasks would certainly be weakened and distorted by any detailed examination of the relationships between different kinds of representations and those between three required operations, besides those

between the representations and required actions. In short, for Mrs O, the pupils' performance and results did not entail the understanding of the sophisticated relationship between the task elements embodying the relational concept of whole and part of a number. The following description of her pupil's performance and work on this set of exercises can provide direct indications of the probable effects of Mrs O's instruction.

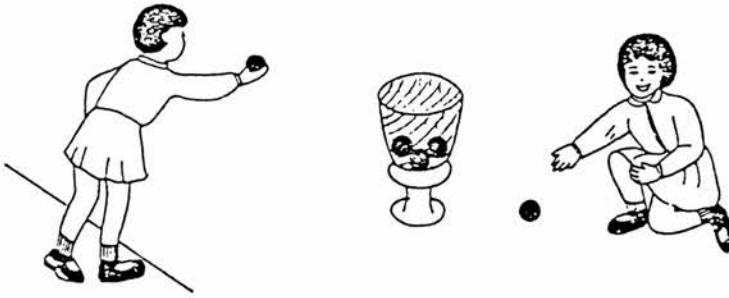
#### *Mrs O's pupil*

After most of the pupils had taken out the mathematics workbooks ready for the instruction, Lim was still breathless. It seemed that he had been playing too hard in the playground to be able to settle down immediately. Even though Mrs O had gone straight on to show what was involved in the first set of exercises and demonstrated the required operations on the blackboard, Lim played with small plastic toys most of the time and raised his head only twice or three times to see what Mrs O and the others were doing. When the class started work, Lim's mathematics workbook was not on the table. Mrs O was angry with him. Lim was then punished for paying no attention, playing with things and failing to get the book ready for work. Mrs O took the book out of Lim's schoolbag and asked him to get started immediately. Lim first turned his pencil round in his fingers and then turned over the pages of his workbook from beginning to end. It was obvious that he did not know on what pages he had to begin work. He then turned to ask the researcher about the page and said that he had not listened to what Mrs O had said about it. In fact, Mrs O did not mention the number of the page on which the fifth unit of tasks started. Mrs O simply said the number of the unit due to be done in the period. A neighbouring classmate told Lim that it was the fifth unit he should deal with. Lim was still unable to figure out where the fifth out of ten units of tasks was located. Lim could not even tell whether the task was located at the beginning, middle or end of the book. Lim had a glance at his neighbouring classmates who had found the right pages and then turned the pages backward one by one. For nearly five minutes, Lim could not get the right page, although two classmates told him that 24 was the number of the page in which the first set of exercises was located. Lim obviously could not recognise numbers beyond 10, as he started to turn over the pages after page ten aimlessly. More importantly, Lim did not know when he had passed page 24. Until one pupil seated in the next row approached

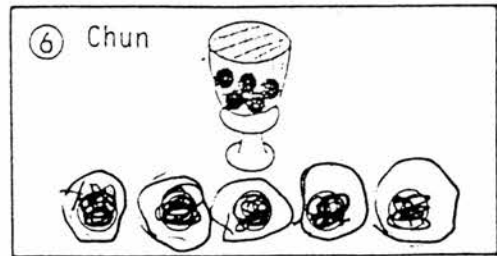
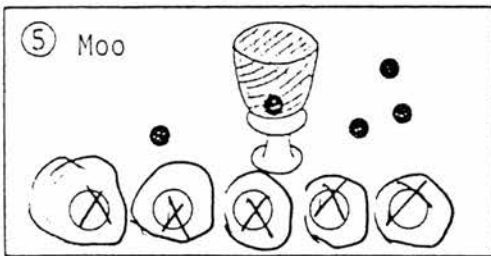
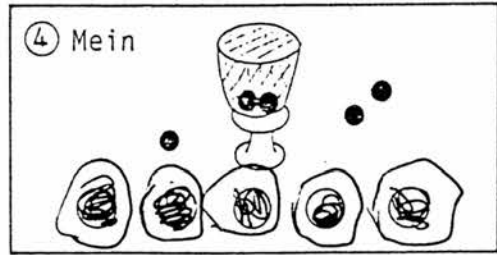
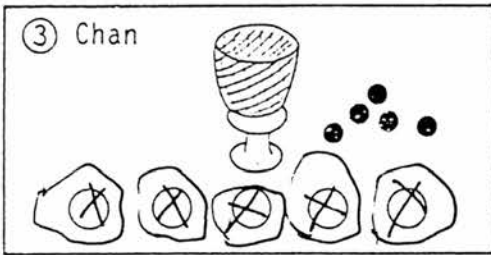
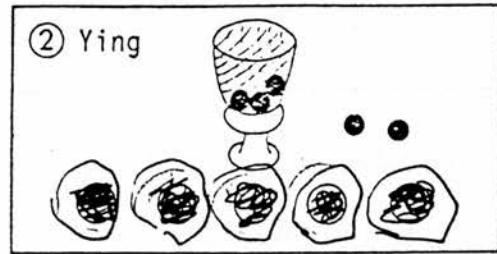
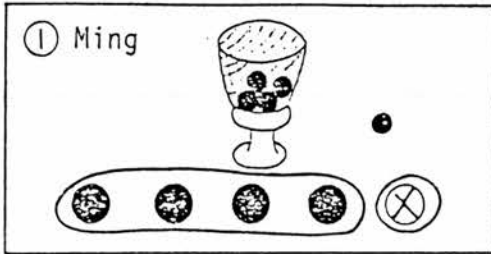
him and turned to the page for him, Lim had been turning the pages forward and backward at random.

Consequently, Lim was very late in getting started and lagged far behind the others. Not knowing what to do, or how and where to do it, Lim went over to the classmates near him and copied their answers into his book. It was noted that, however, that Lim could not remember what he had seen from his classmates' work when he sat down and started work. Lim spent a few minutes staring at his pencil, scribbled on the first item and then approached the neighbouring classmates again in attempts to copy their work. The neighbouring classmates pushed Lim away. Lim returned to his seat and started the work by himself. Having failed to spell out the first syllable and its corresponding Chinese character beside, Lim looked at the first item for a while and then crossed out every circle underneath the basket in the third item. Having looked at the first item again, Lim put each crossed circle in a bigger circle. Lim then did the same to the fifth item. Having returned to the first item and glanced at it again for a while, Lim coloured the circles and put every coloured circle in a bigger circle on the second item. Lim seemed very pleased with what he had done and continued to do the same to the fourth and sixth items. Figure 9.2 illustrates Lim's work.

A combination of interviews and observations indicated, first of all, that Lim did not pay attention to Mrs O's instruction, so that he lacked necessary pre-work understanding of the relevant information about the representations and required operations. It was then shown that his thinking was largely dependent on his own ideas of the representations and illustrations presented in the first item at a superficial level. His actions were directly a result of imitating what had been shown in the first item but which were not shown in the others. It was surmised that, without sufficiently real understanding of the meanings of the required operations and their relationships with two kinds of representations due to cognitive and language deficits, meaningless imitations led Lim to produce worse work than he should have done. According to Mrs O's viewpoint, Lim could have carried out one or even two required operations at least in terms of his abilities to perform related learning outcomes. A lack of effort and willingness to involve himself in instructional activity and to try to understand the learning materials was considered to be the cause of Lim's unfavourable performance and bad results. Lim revealed that he wanted to complete the work as soon as he could, although he



(1) Colour and group: How many are there thrown in and not thrown in the basket respectively? Put them in a circle.



24

(refer to page 33 in the textbook)

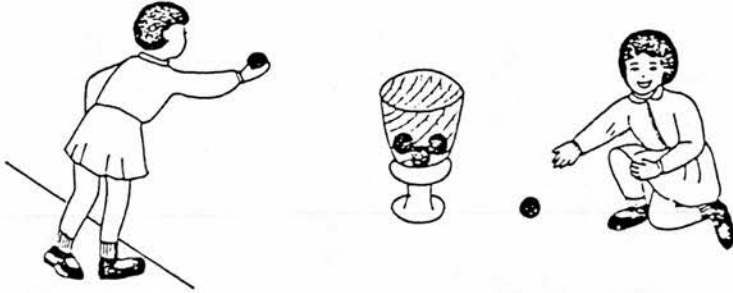
Figure 9.2 Lim's work on the first set of exercises

knew the results were very likely to be inaccurate. In attempting to illustrate the effects of the instruction on the children's performance and work, the following section will provide a rather different picture of presenting the same set of exercises in the different setting.

#### *Mrs U's instruction*

In two periods on Wednesday morning, Mrs U completed instruction for the first and second sets of exercises in approximately forty-five minutes, thirty minutes for the first set and fifteen for the second. Mrs U started the instruction by asking the class about ball-throwing games played in the community where her pupils lived. Mrs U selected three pupils in particular who were frequently seen to pay no attention to the instruction, one able, one average and one less able, to describe games they played. The less able pupil, who coincidentally was one of the target pupils under observations, stayed quiet in response to Mrs. U's request. Mrs U asked him to stand up and pay attention to the others' remarks. The pupil of average ability said that the game they played was to throw the ball to each other. The top pupil said that they made a small area on the ground and then threw light objects into the area at a distance. He was then asked what had to be done in judging the results of the game. He suggested two decisive points: (1) counting the objects thrown in the area and (2) comparing the number of the objects each player threw into the area. It was explained that the winner was the one who threw more objects into the area than others. Mrs U then summarised two key points related to the targeted exercises, drawing on that top pupil's detailed and comprehensible explanations: (1) the inevitable consequences, i.e. the objects thrown in the area and those not in the area, (2) the number of the objects in the area determining the winner of the game. Mrs U asked the class for the best way to present the results of the game clearly. Most of the pupils suggested to put the Arabic numbers on paper which indicated the number of objects thrown in the area.

The class was then directed to look at the blackboard in which four different results were presented in the same modes, background story, and illustrations as those shown in the workbook (see Figure 9.3). The only difference between these two sets was that seven balls were prescribed in the example exercise, while five were found in the workbook exercise. No sooner had Mrs U asked the pupils to pay attention to the first item in the example exercise, showing five balls in the basket, and two



(1) Colour and group: How many are there thrown in and not thrown in the basket respectively? Put them in a circle.

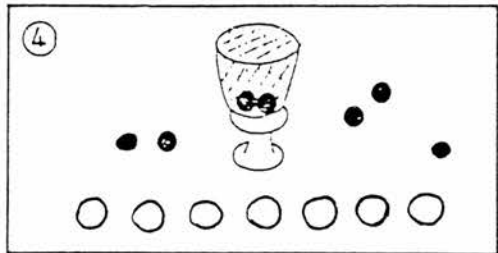
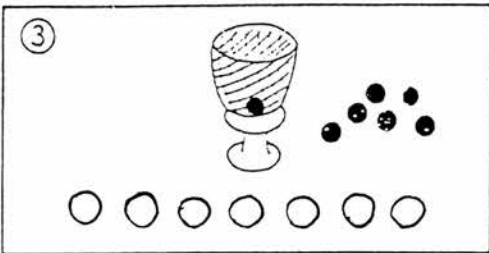
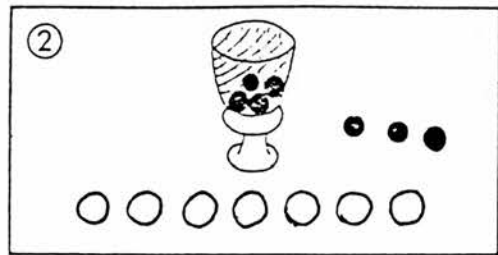
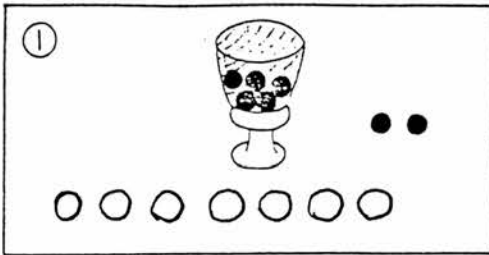


Figure 9.3 Mrs U's examples illustrated on the blackboard

not in the basket than almost all pupils sounded out two numbers, 5 and 2 immediately. Mrs U then asked the class for an alternative way to represent the number of 5 for those who could not recognise the numbers. Having heard suggestions different from those planned in the workbook exercises, Mrs U made her pupils believe that the best way was drawing the number of circles representing the number of balls given to play with. The class was then directed towards the clear and firm suggestion that as many circles should be coloured as objects were thrown in the basket, and they should cross out as many as those not in the basket. A pupil was then asked to do the second item on the blackboard. This pupil coloured four circles and crossed out three circles in response to the result showing four balls thrown in the basket and three not in the basket. Mrs U subsequently returned to the first item and put five coloured circles in a big circle and two crossed circles in another big circle. Mrs U then asked the class to work out the reasons why she had done that. A top pupil inferred that circling them round in two groups enabled the observer to see the results, immediately, easily, and clearly. A less able pupil was then asked to put five circles in two big circles on the second item according to the results shown. This pupil stayed silent and stared at Mrs U instead. An average pupil was asked to do it then. This pupil put four circles in a big circle and three circles in another big circle. Another two average pupils were asked to do the other two items on the blackboard. Two carried out accurately the three operations, colouring and crossing out the circles according to the number of the objects in and not in the basket, and putting coloured and crossed circles in two big circles respectively. Mrs U emphasised that the pupils should be careful not to leave out any of the required operations in one way or another. The following section will indicate the probable effects of Mrs U's instruction.

#### *Mrs U's pupil*

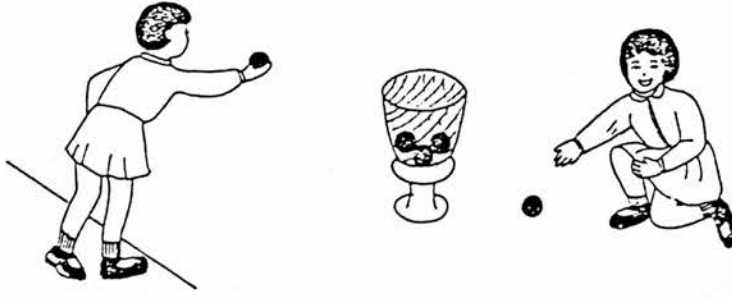
Dun and Lim had disadvantages in common. During the instructional sessions, Dun was asked to pay attention whenever he was found drawing pictures from science fiction cartoons instead of listening to the instruction given for the scheduled exercises. Dun was once asked to explain what the example exercises on the blackboard meant and what he had to do with them. Dun said that he did not know and then he was punished by standing up and listening to others' answers carefully. Certainly, Mrs U did not allow Dun to sit down until he was able to give accurate answers. Having stood up for five minutes, Dun was asked to instruct



Mrs U on doing the third item on the blackboard. Dun first told Mrs U to count the balls in the basket (Dun sounded out 1, 1 ball together) and then he asked her to colour one circle underneath the basket. Subsequently, Dun asked Mrs U to count the balls not in the basket (Dun sounded out 1, 2, 3, 4, 5, 6, 6 balls at the same time) and he told Mrs U to colour six circles. Mrs U then asked the class if Dun had instructed her to do the work correctly. A number of pupils replied that Dun was wrong to tell Mrs U to colour six circles because circles representing the balls not in the basket should be crossed out. Mrs U restated and accentuated this key point to Dun, who nodded to show that he would remember it, and he was then allowed to sit down.

The accuracy and inaccuracy of Dun's work (Figure 9.4) indicated the effects of Mrs U's effort to keep him from being distracted from the instruction and give him opportunities to understand what the exercises were all about and what to do with them. A combination of interviewing and observations found that Dun's encouraging performance and results benefited from practising two required operations with Mrs U prior to the start of work, i.e. counting, crossing out and colouring in the circles. It was revealed that Dun's failure to put coloured and crossed circles in two big circles respectively was related to both a lack of pre-work experience of this required operation, his inability to process the relevant information given on the surface and occasional inattention. It seemed highly likely that Dun could not have carried out those operations if he had not had the opportunity to rehearse it before starting work.

The marked difference in the performance and the quality of the work of Dun and Lim suggested two important points. It should be emphasised that, while it is only possible to present here two case studies to illustrate these points, they do represent a more general conclusion derived from a substantial number of instances throughout the observations made. Children of limited ability can benefit considerably from the teachers' interesting, relevant, sufficient, and understandable demonstrations, explanations and immediate rehearsals of the required operations. The reverse is also true. Children are less successful and produce poorer work when their individual disadvantages distract them from instructions which are fast, continuous, concise, general, language-based, and fact-laden. More significantly, it was noted that the disadvantaged children failed to relate limited learning outcomes and fragmented understanding of the instruction to the representations



(1) Colour and group: How many are there thrown in and not thrown in the basket respectively? Put them in a circle.

① Ming

② Ying

③ Chan

④ Mein

⑤ Moo

⑥ Chun

24

(refer to page 33 in the textbook)

Figure 9.4 Dun's work on the first set of exercises

and required operations involved in the tasks. Mrs U suggested that the nature of reception classroom environment and instructional ineffectiveness deprived most of the less able children of opportunities to have direct experience of the required operations which could bridge this gap between related learning outcomes and the task demands prior to the start of work. This might explain in part the devastating effect of Mrs O's instruction which denied such pupils' the opportunity to experience the exercises before starting work. The above descriptions implied that the children's optimal performance depended on sufficient explanations and demonstrations of the key points, inherent demands and required operations. This implication will be further supported by the following descriptions of two children, with markedly different characteristics, in their response to the same treatments of the tasks.

### **9.3 Two interactions with the second set of the exercises**

#### **9.3.1 The Task**

The second set of exercises were not as simple as they might have seemed to be on the surface. It required pupils to show different ways in which 'nine' could be found by drawing circles on two 'plates' - 3 and 6, 4 and 5 etc. The analysis of the task elements combined with interviews with Mrs U identified four demands inherent in the exercises. First, to extract the meaning of the exercises by processing written instructions, but with little information available to gain sufficient understanding of what the exercises were all about. Second, to recognise the hidden fact that six semi-concrete objects were uniformly prescribed to all items in this set. Third, to set up one-to-one correspondence between semi-concrete objects, symbols (numbers) and actual operations, i.e. counting the objects, drawing the circles and writing numerals. Fourth, to differentiate close- and open-ended problems. Mrs U explained that the written instructions contained odd usages which were presented in the style incompatible with the Chinese written and oral language. More specifically, the written instructions did not make any sense to the children. It was said that almost all the teachers had to change the statements into those familiar and meaningful to the children or put them as the theme of a contextual story based on the same mathematics concept. As far as the second set of exercises were concerned, six objects were given to pupils in full on the first item,

reduced in part in the second and third items, and disappeared on the final item. It meant that the children were given an opportunity to make the story of 6 at will on the final item.

### 9.3.2 Mrs U's instruction

What and what makes 9? Draw and fill in.

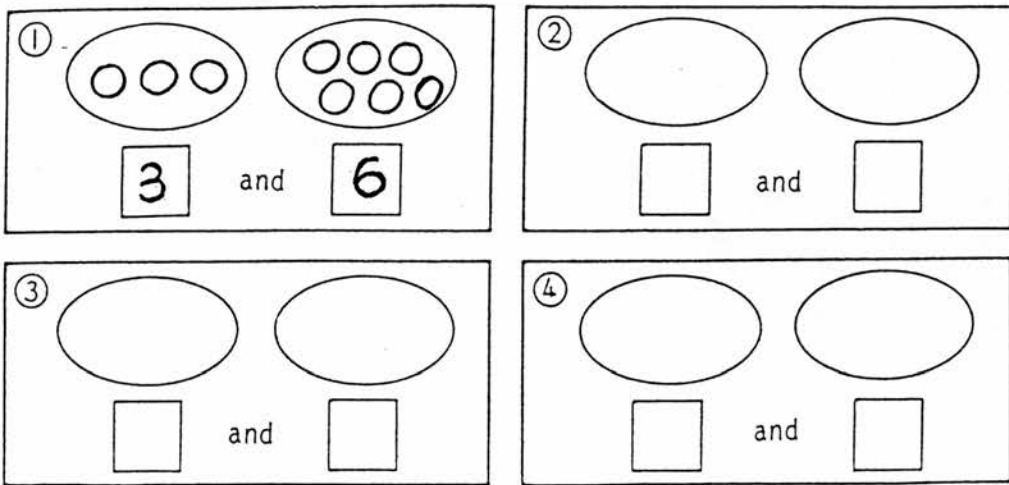


Figure 9.5 Mrs U's examples illustrated on the blackboard

Moving on to the second set of exercises, Mrs. U started her instruction by making a story of 9 with fingers. Five pupils were selected to stand in a row facing the class. Mrs. U told the children that she and the first pupil were to share nine coins. Mrs. U then asked this pupil how many coins he would have got if she took three (Mrs. U unfolded three fingers immediately). This pupil then unfolded six fingers and said six to Mrs. U. Mrs. U quickly drew three circles on an imaginary plate on the left and wrote 3 in the square underneath the plate, and six circles and 6 on the right on the blackboard (see Figure 9.5). Mrs. U stressed to the class that counting on fingers was the easiest way of working out accurate solutions to the counting

problems given. Mrs U asked three following pupils the same patterns of questions and these pupils unfolded their fingers, adding Mrs U's up to 9. Mrs U, for example, unfolded 2, 5, and 6 fingers and three pupils were expected to unfold their 7, 4, and 3 fingers. These three pupils were then asked to draw circles signifying the respective numbers of unfolded fingers of Mrs U's and theirs in the example items on the blackboard in the same ways as Mrs U did to the first item. The class was then required to make judgments on the accuracy of the pupils' work on the example exercises. Finally, the class was asked to speak out the statements when Mrs U returned to the pupils and brought their unfolded fingers together once again, e.g. "9 can be divided into 2 and 7", "9 can be divided into 5 and 4", "9 can be divided into 6 and 3", and "9 can be divided 8 and 1". Having finished a second round of the game using the number 'seven' with the same pattern of activity as the first time, Mrs U proceeded to guided reading of the written instructions in the workbook. But Mrs U related the exercises to the finger game she had conducted and stressed that in this second set of exercises four imaginary pupils were invited to play the game of six fingers in total and the results were shown in four items respectively. Mrs U ended her instruction by reminding her pupils of the two required operations, i.e. drawing the circles and putting the corresponding numbers in the squares.

### 9.3.3 The first target pupil

Tou, a child whose parents married in their early twenties, lived with his grandparents and another seven cousins. Tou's mother was a university graduate but became too ill to look after him after he was one year old. Tou's father lived on his own and visited him nearly every day for one or two hours. Thus, Tou was allowed to spend his time on whatever he wanted. Tou was noted for unusual common sense, experiential knowledge, problem-solving skills and communicative ability. Tou's personality was characterised by being venturesome, active and curious about new things, and straightforward in showing his emotions without reservations. Notably, Tou had passive attitudes and negative feelings against energy- and time-consuming work and school matters in particular. Tou did not learn things and do the work in the first place until he was reinforced by pocket money and toys.

In the kindergarten, Tou was described as being unable to put up with strict classroom discipline and requirements for the completion of written work. Thus, he stopped going to the kindergarten after fifteen months. Lacking the aptitude for structured learning programmes and having a poor memory, Tou left the kindergarten with knowledge and skills of language and mathematics planned in Primary 1 at the basic level. In Mrs U's class, Tou was noted for his impressive ability to express himself verbally and talk about everyday experience related to the lesson topics. But Tou was described and observed as having a bad temper, being lazy, and playful, daydreaming, being easily distracted, impulsive, impatient, self-confident and unwilling to remember things happening in school, and those concerned with learning in particular. On most occasions, Tou looked out of the window and waited for the bell to ring. A combination of unwillingness to remember things intentionally taught and negative attitudes towards learning materials, as Mrs U indicated, led Tou to acquire far less subject-matter knowledge and skills than he should in terms of his ability to learn. Mrs U thought that Tou would do better if his family could discipline and guide him in the way academic matters were implemented at school. A combination of interviews, observations and analyses of Tou's previous work showed that he could recognise numbers to 10, meet the demand for one-to-one correspondence between concrete objects, semi-concrete objects and numbers, and perceive single-phoneme syllables and Chinese characters representing the most common objects, such as the aeroplane. Tou could code neither two-phoneme syllables, signifying uncommon words, nor almost any three-phoneme syllables incorporated in the language programmes. Although Tou had a good command of spoken language and communicative skills, his performance and work indicated his great difficulty in doing tasks which demanded comprehension and those required him to make up sentences. Interviewing Tou indicated his inability to associate his spoken language with corresponding written scripts. It was noted that Tou did very well at mental arithmetic up to ten thousands. Tou's language disability led to his failure to sort out the solutions to the word problems in addition and subtraction .

In this particular task, Tou started this task very late because he was enjoying watching some senior pupils planting and watering seeds in the school garden outside his classroom throughout the instructional session. Although Tou was called once to play the game of making the story of 9, he did not get it right. Tou

just kept silent and stared at Mrs U who exploded in a rage at his playful attitudes. Tou still looked around and played with something in his hand. After the whole class began work, he did not know where he should start or what he had to do. After starting work, Tou tried to look at the book of his neighbouring classmate on the right, but was blamed by Mrs U for copying others' work. Having returned to his own book, he looked at the first item, counted up two plates of circles and recited 1, 1, 2, 3, 4, and 5. Tou then stared at 1 and 5 which were already presented in two squares underneath two sets of circles. Moving on to the second item, he counted the circles on the left and then put number 2 in the square on the left. Shaking his head and biting his nails seemed to indicate that he could not understand why the plate on the right was empty. Tou then asked the researcher for further explanations of the exercises. Having been encouraged to think what Mrs U had demonstrated and make sense of the first item on his own, Tou put a zero in the square on the right. Tou responded to the third item in the same way, putting the number of 3 in the square on the left and a 0 in the square on the right. In looking at two empty plates on the final item, Tou marked one 0 in each square. Figure 9.6 illustrates Tou's work.

(2) What and what makes 6? Draw and fill in.

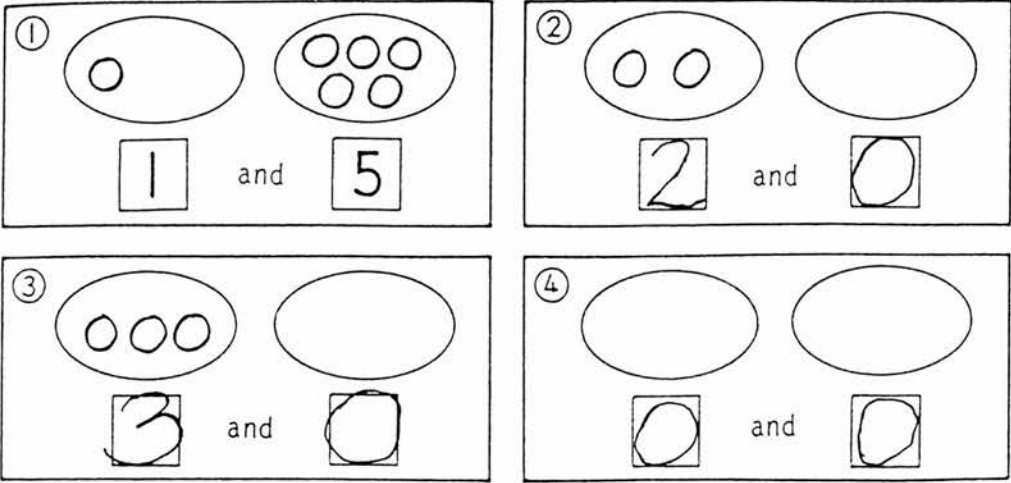


Figure 9.6 Tou's work

Observations showed that Tou's inattention to Mrs U's instruction had led him to depend heavily upon his own surface interpretations of the relationship between all the information shown. Interviewing Tou indicated that his thinking, understanding, and acting upon the exercises was primarily subject to fixed factual knowledge of numbers and overwhelming prior experiences of one-to-one correspondence between concrete objects, semi-concrete objects and numbers. It was also shown that Tou had established solid associations between the representations and actual operations. Tou's work suggested the profound effects of the close-ended formats of exercises which ran through almost all units of tasks. Conversely, Tou's performance implied that the disadvantaged children's thinking did not come to terms with the context in which problem conditions were left to the children themselves to decide. In other words, it seemed to be more likely that the less able children would do better work if they were faced with the context in which the conditions were set completely, or in part, beforehand.

#### **9.3.4 The second target pupil**

Cen was a very tidy, dependent, responsible, quiet, shy, disciplined and diligent girl in the Mrs U's class. Cen's parents had a big gap between their educational background and ages. It was the poorly-educated mother that stayed at home and looked after the family. Cen's short and tense tongue led her to be inarticulate. However, Cen had liked to know new words and look up the dictionary with her elder sister ever since she went to kindergarten. But Cen did not possess sufficient command of language. According to the kindergarten report, Cen worked very hard, concentrated on learning activities from the beginning to the end of the session, and was very determined to complete the work in time. In short, Cen was described as having a pleasant personality and being very disciplined. These favourable attributes continued to be observed in Primary 1. A combination of interviews, observations and her previous work showed that Cen had difficulty in absorbing high-order knowledge and skills, such as deductive reasoning, grasping relational concepts, categorising representations, constructing the meaning of a text and generalising principles from facts. Cen obviously learned by rote. More specifically, Cen's previous language work and related learning experiences indicated that she could do two-thirds of dictation exercises and fill-in-blank exercises. Cen's difficulties were seen in doing tell-the-story exercises and true-or-false comprehension exercises, due to limited factual knowledge of linguistic



constructs and conditioned responses to a certain set of verbal modes. Cen's performance and work on mathematics programmes indicated that she had tremendous difficulties in doing work concerned with subtraction and those formulated in the form of word problems and unmatched parts of two sorts of representations in particular. Cen also lacked knowledge and operational definitions of ordinal numbers. It was noted that Cen had partial understanding of zero and the relational concept of whole and part of a number. Cen was, however, good at doing the sums and object-to-number correspondence exercises.

During the instructional session, it seemed that Cen paid full attention to Mrs U's instruction. In rehearsing making the story of nine, Cen unfolded three fingers when Mrs U showed her six fingers. Cen started work on the first and second sets of exercises after Mrs U finished her instruction. Having learned that the first item in the second set of exercises had been done by an imaginary child, Cen started doing the second item. Having counted the circles shown on the plate on the left, Cen unfolded two fingers on the left hand and recited 1, 2. Subsequently, Cen unfolded the right-handed second finger and recited 3, the third and 4, the fourth and 5, and the fifth and 6. Cen then counted up the number of the unfolded fingers on the right hand and recited them 1, 2, 3, 4. She drew four circles on the plate on the right. Having looked back the first item for a while, Cen started to sum up two plates of circles respectively and put the numbers 2 and 4 on the accompanying squares.

Having repeated the same patterns of actions with her fingers doing the third item, Cen failed to work out the fourth item which did not provide her with any representations. It was seen that Cen stared at the item for a while, had a look at the previous three items, and then asked the researcher the reason why there was nothing shown on the two imaginary plates. Surprisingly, Cen left the item unsolved. Cen subsequently explained that she did not know how many fingers the imaginary teacher would unfold and thus she could not decide the amount of fingers she could unfold on behalf of the imaginary child. Figure 9.7 illustrates Cen's work.

(2) What and what makes 6? Draw and fill in.

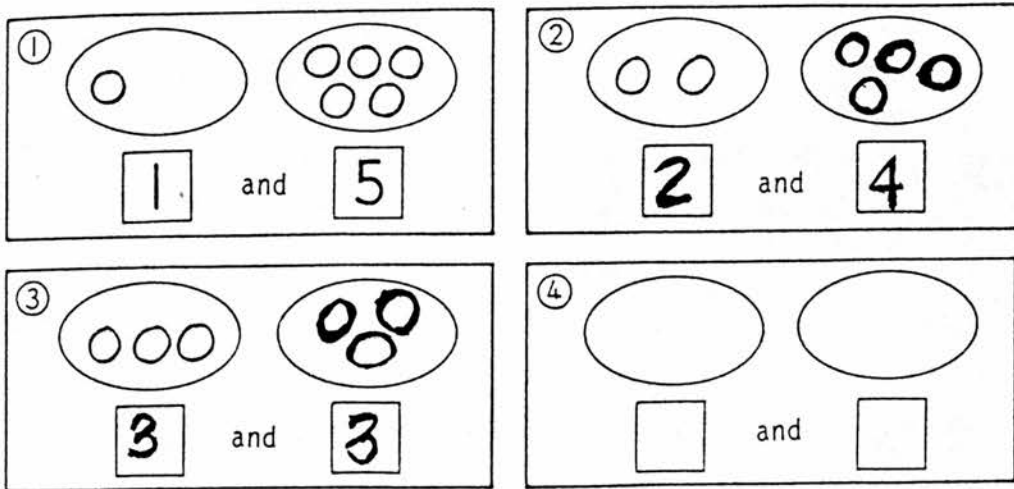


Figure 9.7 Cen's work

Cen's effort to pay full attention to Mrs U's instruction was found to be the key to her understanding of the relevant information necessary for the completion of the exercises. Interviewing Cen suggested that, although this set of exercises was planned to consolidate the concept of whole and part of a number at the operational level, Cen's optimal performance and encouraging work benefited from her solid establishment of mechanical associations between fixed factual knowledge of the representations and numbers, and the actual operations of counting. Insufficient understanding of the relational concept of whole and part of a number and language comprehension did not predominantly undermine Cen's thinking and carrying out the exercises. Cen's work on previous units of tasks, which were all formulated in the close-ended modes, ensured satisfactory effects from learning by rote and concrete thinking in aid of the stimulus-response mechanism. Cen's errors made on the work were primarily due to a lack of high-order knowledge and skills which seemed to be beyond her reach.

These two cases in the Mrs U's class demonstrated the disadvantages of the tasks and children's own characteristics and their effects on children's performance and

work. Again, they are just illustrations of many instances observed among the target children as they carried out these, and similar, tasks. It was indicated that the children's difficulties were greater where there was a big gap between the consecutive exercises in formats, demands for intellectual skills, and actual operations. It was also shown that disadvantaged children tended to be better at dealing with close-ended problems for which there were clear and definite directions of intellectual resources and actual operations to follow. Clearly, the children's dispositions to the tasks in particular affected their motivational orientations and efforts to take their part in the instruction and in the completion of the work. More specifically, the children's attitudes and feelings about the lessons and tasks influenced the extent to which their cognition and language skills could be activated optimally to process the relevant information necessary for the engagement and accomplishment expected and required. It could be suggested, for those who were not well equipped with relevant and favourable cognitive abilities and language skills, that optimal performance could be achieved by a deliberate effort to be completely intellectually involved in the lesson activity and processing of information integrated in the exercises.

According to current educational thinking, a teacher is expected to achieve learning equality, overcome material disadvantages, eliminate prejudice, and identify the needs of individual children. But such expectations and demands on a teacher cannot be considered realistic when one adult is asked to achieve all these ends for forty-five children in the classroom. The Taiwanese reception class is such an example. Under the current school system, the disadvantages of the children and the inadequacies of the workbook tasks cannot be overcome completely by a class teacher on her own. Nevertheless, the case studies suggested that effective instruction, and the children's positive attitudes and constructive effort, might eliminate some of the disturbing effects on children's disabilities and of the confusing learning materials, provided in the unsatisfactory situation described above.

Although her pupils benefited from her instruction a great deal, as Mrs U stressed that there were three unfavourable consequences as a results of undertaking the necessary and sufficient instructional activity. First, she was lagging behind the progress schedules and this created great pressure on her. Second, taking over the periods allocated to other subject areas to catch up on this required work deprived

her pupils of opportunities to learn things in those areas. Third, as the school-wide inspection was near, she and her pupils alike could not work through the textbooks and workbooks, adequately and sufficiently while trying to catch up with the scheduled progress in a much shorter time. These three factors were said to undermine the quality of working experience of Mrs U and the learning experiences of her pupils. In short, Mrs U represented a special case of an effective teacher needed by all children in reception classes in Taiwan, and yet, judged by her progression rates, she could come under criticism. Important implications of her instructional practices will be discussed in the next chapter.

## **CHAPTER 10**

### **Conclusions**

This has been an exploratory study employing qualitative methodologies and strategies to identify influences on pupils' progress since starting formal schooling. The study was undertaken in a special socio-cultural context in which the early years of schooling proceed in a fundamentally different way to that currently implemented in most western developed countries. This final chapter is divided into four parts. Firstly, the research methodologies adopted in the study are reviewed and discussed in retrospect. Secondly, the findings are summarised and discussed in relation to the previous research and their implications for reception class teaching in Taiwan are outlined. Thirdly, on the basis of this discussion, practical and feasible suggestions are made to improve the current situation for children entering school. The concluding section outlines further investigations which are required.

#### **10.1 Methodological discussions**

The reflections on the research methods employed in the pilot study and in the main study raise two major questions: (1) How appropriate were the data obtained in the study to the research question addressed? (2) How valid were the data collection procedures and the interpretive processes adopted?

##### **10.1.1 The appropriateness of the data obtained**

Clearly, starting school involves multiple realities. Thus, the data collected in the present study were intended to illustrate those multiple realities of starting school. The findings specifically attempted to gain multiple explanations and comprehensive understandings of the important causes of children's difficulties in making progress in the reception class. A combination of interviews, observations and content analysis established the nature of starting school, i.e. dependency of context, content, individual and time, and interrelationships of objects, instances, phenomena, processes and results.

In the interview situation, the main idea was to enter into an ever-developing interactive encounter with the respondents, particularly with the children, and to

explore their thoughts about their school performance, with a focus on the accomplishment of the specific tasks to the greatest possible extent. For the vast majority of the parents and teachers involved, the interview situations and questions provided a special opportunity to reflect purposefully and deliberately on the reality of starting school. They realised that the importance and the significance of this special occasion had been ignored or taken for granted before the outset of the fieldwork. Indeed, the children's written work helped these non-reflective respondents relate their thinking closely to specifically important instances, performance, and outcomes.

Interviewing children as young as this was obviously more difficult and demanding than talking to the teachers and parents. It required immediate decisions to devise strategies which would direct children's thinking more closely towards the interview questions in specific and comprehensible terms. Since the vast majority of the sample were at a great disadvantage in many aspects, it often happened that their replies to interview questions were short and terse, or even non-informative answers like *I don't know* or *I forgot it*. More specifically, most of the children could not initially explain how or why they performed the tasks in the way they had. In helping these children to give reasons for their task performance in retrospect, two alternative strategies were adopted. Some children were asked to give answers to questions formulated with the same demands as those in the workbook tasks. They were then asked to explain their actual operations whenever aspects considered to be important arose in the course of interviews. Others were asked to make comments on the accuracy of the answers given by the researcher which were different from the children's. Having given reasons for their judgments about the answers provided, these children were then asked to explain why they had given their own answers. It was found that these children could give key points, explanations, and justifications for their performance and results more easily and fruitfully where these two kinds of alternative example were given. Not surprisingly, the teachers gave more information covering a wide variety of issues, as they had a better command of language, more relevant professional knowledge, and more direct experience of the reality under study.

Classroom observations obviously provided direct access to the here-and-now reality on which field-based descriptions were drawn. The purposive sampling of the children from contrasting catchment areas was intended to maximise the scope

of acquired information. The findings proved that contrasting subjects and settings provided a wide range of informative data. It was also found very useful to compare observational data with interview data, particularly when there was closely related, conflicting, or vague information, considered to be important enough to be interpreted in depth. Writing accompanying notes and comments on the recorded data allowed a progressive focusing of subsequent interviews and observations on the issues identified as salient. Content analysis of the children's work enabled the researcher to complement, corroborate, and objectify the descriptions, explanations, and interpretations of all the acquired data. This strategy also helped inductive processes by which conceptual categories were delimited.

The frames of reference provided the rules which underpinned the delimitations of emergent categories. Of the categories delimited and conceptualised, cognitive ability was the most difficult to pin down in concrete terms due to the abstraction, vagueness, and overlap of the properties of the factors being identified, despite the fact that these factors were thought to be of fundamental importance to the children's performance and results. Relatively speaking, categorising the factors related to the facility in language was an easier task because their properties were more expository, more demonstrative, and clearer. The factors concerned with the approach to work were observable enough to be described and categorised straight away in terms of the related descriptions and manifestations of their properties. The meanings of the factors concerned with socio-psychological states were commonly recognised as they were described. Physical deficiencies and disadvantages, which occurred in a few cases, were found to be definite and concrete enough to be categorised as described and observed.

In summary, in processing data and delimiting categories, there emerged a hierarchy of qualitatively different influences on children's slow progress and causes of their difficulties in doing the tasks in particular. To a significant extent, the factors identified were interrelated and the influences were cumulative.

#### 10.1.2 Validity of collecting, processing and interpreting data

Drawing on the suggestions made by Lincoln and Guba (1985), five measures were taken in the present study to ensure the validity of collecting, processing and

interpreting data: prolonged engagements, persistent observations, triangulation of the research methods, frequency and salience of issues, and respondents' checking. First of all, four months of fieldwork of the main study was the maximum period during which the teachers could tolerate the researcher's necessary attendance and intervention. It was sufficiently prolonged to build up the trust and rapport between the researcher, teachers, and children, to achieve the necessary understanding of the whole context and problem, to gain familiarity with the classrooms, modify research schedules, and collect sufficiently credible information. Secondly, persistent observations were helpful in bringing the factors emerging as important together and focusing on them in detail. More importantly, they were also vital to eliminate subject- and situation-bound bias and contamination, which might otherwise distort the findings. As Lincoln and Guba (1985) put it, "prolonged engagements provide scope and persistent observations provide depth." (p.304) Methodological triangulation - interview, observation and content analysis - was the third strategy the present study adopted to ensure the validity of the interpretations.

Once a proposition has been confirmed by two or more measurement processes, the uncertainty of its interpretation is greatly reduced. The most persuasive evidence comes through a triangulation of measurement processes. If a proposition can survive the onslaught of a series of imperfect measures, with all their relevant errors, confidence should be placed in it. (Webb, et al. 1966, p. 3)

The fourth measure to ensure validity involved coding the field data in terms of the frequency of occurrence and the respondents' emphases. This measure ensured both the credibility and the coherence of the categorisations. Participants' checking of the insights was the fifth strategy adopted to ensure the authenticity of the findings and interpretations.

The truths we assert are a function of our procedural norms which in turn are a function of our shared value system. The "truths" researchers generate are a function of the researchers' procedural norms and underlying values. And if these "truths" purport to be about persons other than the researchers then they have indeterminate validity, no secure status as truths, until we know whether those other persons assent to and regard as their own the norms and values of the researchers. (Heron, 1981, p.33)



Of three groups of respondents in the present study, only the teachers could fulfill such a task of checking. In the sessions of fieldwork, the teachers were frequently invited to make comments on the provisional interpretation of data. Their general agreement with these conclusions supported the validity of authentic constructions and reconstructions of their views and the realities under study.

## **10.2 The influences on children's progress in reception classes in Taiwan**

### **10.2.1 The integrated discussion of the findings**

Despite differences in race, culture, age-level and subject, as Phillips et al.(1987) have argued, children's progress is the foremost concern for all involved in school education. As Wood (1988) indicated, a pupil's progress depends on learning, understanding, meeting the demands of school, and applying what is acquired to solving problems at school. More specifically, in his view, such progress often involves the process of moving forward to the "constructive, interpretive and facilitative activities of the more mature and knowledgeable." (p.212) As a result of the constraints of specific political, cultural, and social values and systems on school education in practice, the present study gave a rather different picture of children's progress in reception classes in Taiwan.

Clearly, as the findings and analyses presented in previous chapters show, school-age children's progress, prescribed, valued, pursued, and evaluated in reception classes in Taiwan, was essentially academically-oriented, and quantitatively-based. It was measured in terms of objectively determined increments within the required domains of standardised knowledge and skills. The overall findings suggest that children's difficulties in making progress derived from both direct and indirect factors (based on whether they were observed within the classroom or not). The direct factors were the incompatibility between children's individual characteristics, the learning tasks, and the teachers' instructional practices. The combination of interviews and observations in Chapter 8 suggested that children's inadequacies and insufficient abilities in the mode of cognition and language, and their irrelevant strategies, lack of concentration and inappropriate behaviour were the foremost causes of major difficulties in learning and slow progress. The indirect factors were the disadvantages of home conditions, pre-school learning outcomes which interfered with school learning, and life experiences. It was indicated that the

effects of all these identifiable influences were interactive and cumulative. Overall, the children could be categorised to a greater or lesser extent as intellectually weak, linguistically disadvantaged, strategically unadapted, psychologically unmotivated, or physically unfitted. Notably, inadequate, insufficient and incompatible cognitive ability and language competence were commonly described and observed as the factors most closely associated with children's poor performance and slow progress. Of course, the attribution of the causes of poor performance to inadequacies in the child or the home background serves to divert responsibility from the teachers. As we saw in the review of the literature, 'readiness' for school and early progress depends critically on the particular demands that are put on the child in school. Our findings point up strongly that the poor progress of the children we observed in detail could be explained, perhaps to a substantial degree, by a combination of an inappropriate curriculum, unrealistic time constraints, and inadequate explanations of the tasks. Although these factors are critical, and are also the features most amenable to change, we need here to consider the personal inadequacies of children in more detail, before being able to suggest how best to change the educational context which shows up those inadequacies so starkly.

Cognition and language have been separately and interrelatedly the main stream of attempts of philosophers and social scientists to understand human behaviour. Over decades, several theorists have made a special effort to uncover the reasons why children have difficulties in learning, thinking and performing the tasks prescribed in the early years of schooling. Piagetian perspectives of children's failure suggest that children are incapable of fully making sense of the world around them through cognition and language, until the completion of a series of developmental stages through which they consolidate and reconstruct innate mental structures needed to perceive, reason, and understand matter in logical terms (Piaget & Inhelder, 1969). Piaget contends that any attempt to instruct young children by demonstrating how things work in the instructor's terms leads to inevitable failure if these children do not possess the necessary mature mental structures (Wood, 1988). Although details of Piaget's scheme would no longer be accepted, this basic principle remains true.

The points of view of some of the teachers and parents presented in Chapter 6 are in line with Piaget's view that children's difficulties in performing the tasks lay in their cognitive immaturity and language weaknesses. However, a combination of

interviews with and observations of the target children in Chapter 8 suggested that, for the most part, these children did bring cognitive capacities and language skills into the class and used them to respond to the tasks. Sufficiently substantial evidence indicated, however, that the mental functions used were not the same as those required by the learning tasks and instructions. It was found that most of the children who did poorly made slow progress and had bad results as a consequence of the mismatch between children's abilities, previous learning experiences, the acquisition of existing domain-specific knowledge and skills, demands of the learning tasks, and instructions. This mismatch, in turn, led to insufficient understanding, irrelevant understanding, or misunderstanding of task components and teachers' instructions given for the tasks. Not surprisingly, children without sufficiently accurate understanding, then had greater difficulties in learning and performing the learning tasks to the best of their ability.

A further close examination of children's explanations and performance showed that these unfavourable consequences were closely related to an inadequate conceptual vocabulary which prevented the children from blending unfamiliar verbal representations into meaningful construction. This was shown particularly in their poor comprehension of written scripts and spoken modes, thinking in concrete categorisations by spontaneous intuitions, and over-reliance and over-generalisation of surface features in isolation. However, a combination of parents' accounts of children's real-life experiences and the children's explanations of their own performance indicated that these children's proficiency in the mode of cognition and language were rooted in the everyday world. In contrast, the proficiency necessary for successful school performance is dependent on academic subject matter and formal linguistic requirements. Observations and interviews with the children presented in Chapter 8 provided substantial and convincing evidence that this mismatch between the proficiency children acquired, and that which they were required to achieve in contrasting contexts, caused problems for the children in doing the tasks. Donaldson (1978, 1987) criticised Piaget and his followers, theoretically and empirically, for the irrelevance of their explanations of children's difficulties in school education. Her arguments provided more reasonable and relevant explanations of children's difficulties in doing the tasks given to them by others.

Donaldson contends that children's difficulties in coping with learning tasks at school essentially lie in their failure to disembed formal and abstract modes of learning programmes, instruction and lesson activity.

Thinking (in everyday life) is wholly embedded in a context of action, direct perception, purpose and feeling. It arises spontaneously within this context... By contrast, any problem about a remote setting calls for thought that is disembedded in some degree... More important, more fundamental than any difficulty with specific words and constructions, is the contrast between thinking about a situation which you are actually in and being called on to think about that same situation when you are remote from it in space and time... The difficulties which disembedded problems present do not reduce to questions of linguistic *knowledge*. Yet they have a great deal to do with handling of language all the same... Now the point is that in our ordinary embedded thinking and language-using we do not normally even attempt to make sense of words in isolation... We use all the clues we can get to arrive at what the speaker means. But when we are given a disembedded problem we have the task of figuring out what the words mean: the words on their own. This is an austere and difficult enterprise for the human mind. (1987, pp. 103-104, the parenthesis added)

Central to Donaldson's argument is a distinction between thinking which comes directly out of one's own life's concerns and experience, and thinking which is called for by a purposive but artificial task or problem which is described in more abstract terms. The former orientation draws on the profound effects of real life and personal concerns on the mind. Donaldson contends that one's cognitive capacities are basically directed by personal hopes, interests, and intentions, and make substantial use of clues provided in the entire setting and the people within it. Her explanations of children's difficulties in terms of failure to initiate context-free processing help to make sense of observations among Taiwanese children. It was indicated that children making slow progress had poor attention and bad memories in relation to academic matter, but showed full attention and good memories of events and matters of more practical and individual concern to them. The children progressing well and rapidly were described in the interviews as making a great effort and taking certain necessary actions to sustain their concentration on lesson activity and tasks. As Wood (1988) has argued, "the ability to attend and concentrate is not a natural capacity that children possess to a greater or lesser extent." (p.215) He examined what was involved in the development of children's concentration and found that it involved a number of self-regulated actions, some aspects of which had to be learned.

As Howe (1984) pointed out, the learning tasks were direct influences on children's performance and progress at school. Evidence given in Chapters 8 and 9 indicated that inadequate workbook tasks had exacerbated profound disadvantages the children already had in doing school work in the mode of cognition and language. It was found that, irrespective of the subject areas, disadvantages of the workbook tasks, associated with children's poor performance and slow progress, fell into two domains: the content and the form. In the former case, a combination of interviews with the teachers and content analysis showed that the tasks often presented boring and old fashioned subject matter, difficult symbolic representations and relational concepts, illogical sequence of core knowledge and skills, inappropriate topics, and inadequate treatments. It was also found that the tasks were often complicated by confusing and ambiguous presentations of the information, multiple demands inherent in several operations, implicit rules for presenting the results, and mismatches between presentations, intrinsic demands and actual operations. It was commonly seen that children's difficulties in doing the tasks varied with the subject content and the specific tasks. The children making slow progress were seen to have greater difficulties in dealing with the subject matter in the mode of phonetic symbols in particular, due to their formality, abstraction, unfamiliarity and incompatibility. In contrast, their difficulties in mathematics tasks were associated with meeting simultaneous demands of multiple operations.

The children's immature and inappropriate socio-psychological states took the form of an inability to fulfill the role of school pupil, a lack of motivation towards school matters and of self-confidence and self-esteem in relation to academic performance and achievements. It was also shown through disturbing behaviour and in negative attitudes and distracting approaches to school work. It was noted that these discouraging attributes led the children habitually to avoid *necessary* effort and *full* concentration on the learning tasks right from the moment the work was presented to them. Under such circumstances, these children did not even begin to approach the tasks. Increasing intrinsic difficulty of the content and growing complexity of the form of the tasks were then seen as leading the children to be faced with ever increasing difficulties in doing the tasks. These unmotivated children's accumulating failure was found to lead to a virtual halt in interest, willingness, effort, and achievement. Their main target became the completion of the work by filling in all blank spaces in time, in order to be free to play in a break, instead of the pursuit of high quality of results and the elimination of avoidable errors. In

achieving this immediate objective, as a result, these unmotivated children were noted to adopt certain irrelevant or even unreasonable context-specific strategies for the completion of the work as the first priority, and a few became opportunists. This kind of instance was unintentionally reinforced by the teachers who attempted to keep up with progress schedules.

Physical deficiencies and immaturity were seen as depriving a certain number of unhealthy or weak children of opportunities to take a full part in school activities. It was also found that all school children had to make a specially strenuous effort to complete a huge amount of written work due to their under-developed motor coordination as a natural consequence of children's development. Left-handed children were found to have greater problems in doing the written tasks. The explanations of the parents and teachers in the interviews indicated the social and cultural origins of this kind of disadvantage. It was said that these children would not have been at such a great disadvantage if their parents had not forced them to change the natural course of the development of their left-handedness. One suggestion to alleviate this situation was that teachers should teach writing in ways which favour both the right- and left-handed children simultaneously even though the writing system of the language of Chinese is formed in the right-handed direction. Being forced to use the right hand was seen as a cause of these children's unnecessarily greater difficulties, poorer performance, and slower progress. At worst, this kind of avoidable or solvable disadvantage created tremendous frustration for the children. Above all, it undermined the likelihood that children would make an effort to produce good quality work to the best of their ability in the first place.

The above five categories of children's individual characteristics were found to be associated with previous experiences, existing learning outcomes, and, more significantly, the people who provided the children with access to these crucial learning experiences. A combination of findings from the pilot study and main study suggested that a bad start at school, poor performance and slow progress were related to the mismatch in children's learning experiences between home and pre-school institutions, and school, in the following four domains: (1) the role of the knowledgeable and mature adults - the parents at home, the kindergarten teachers, and the reception teachers, (2) the content of the learning material intentionally provided, (3) the way the learning activity was structured, and (4) the requirements

and rewards set to monitor and regulate children's performance and results in the desired directions. Cleave et al. (1981) and Barrett (1986) also found that children's difficulties occurred when confronting a discontinuity as a result of being faced with people, situations, demands involved in routine activity, and learning programmes unfamiliar to them. Wood (1988) went further:

Formal education faces children with many demands that are not a regular or frequent feature of their everyday experiences outside the classroom. The practice of education confronts all children with important and necessary *discontinuities* in their intellectual, social and linguistic experiences. (p.213)

As the interviews and observations presented in Chapters 4, 6, 7, 8, 9 indicated, for the most part, entrants were faced with and had to meet the demands inherent in teacher-led language-dominated instructional interactions, book-based activities, work-oriented requirements and outcome-bound reward systems as soon as they started school. These unfamiliar demands, which children had not experienced before starting school, were described as causing particular problems for children in adapting to new situations of reception classes. If they are to make good progress in their learning in school, it was found that children must, as soon as possible, develop the ability to manipulate and reflect on symbols in cognition and language. They must also be able to interpret word meanings referring to core concepts for themselves throughout the teacher's instruction, and to transform their interpretive understanding to corresponding operations in the time allowed. Six important factors were found to make this kind of progress more difficult to achieve: non-availability of individualised, immediate, and detailed help, insufficient resources aiding learning, too short a time given to cover the learning tasks, standardised progression rates set to be followed, requirements for the completion of a fixed amount of work to be made, and the precise and formal way in which answers have to be given. The most serious disadvantage commonly was described as a lack of time to stop to think and respond properly. Optimal learning and performance were said to require more time than was currently allowed. It was recognised that reception teachers were in the best position to help children to alleviate the disturbing effects of these situational demands and, more importantly, to have a proper understanding of the nature of the learning tasks that they went about.

It was clearly seen, however that for the most part the teachers' instructions were undertaken in the traditional way in which only the surface features of key points and the required steps of procedures were spelt out and shown straight away as they introduced the children to the tasks. Under such circumstances, most of the teachers' explanations and demonstrations failed to lead children from concrete experience to conceptual thinking. For example, in Chapter 8, a child was able to call one object "triangle" correctly, yet a square-shaped object was called "two triangles". This implied that this child's word "triangle" did not necessarily represent visual perceptions of the whole geometrical dimension, given his entire ignorance of the shape of a square. Interviews showed that this child had correct perceptions and could use the correct word to refer to the meaning of this shape. He interpreted a square-shaped object as two triangles. It was clear that this child still did not understand the concept of 'triangle' or even 'square', although he could sound the relevant words. Although that particular interview extract did not provide any information of how the teacher taught children definitions of triangle or other shapes, it seems likely from other observations that concepts of the shape were established through the teacher's verbalisations of the meaning of 'triangle' and the drawing of the shape. This observation suggested an easily-ignored difference between a child and an adult teacher in the mental processing of words referring to concepts. Almost all episodes of instruction observed in Taiwanese reception classes failed to come to terms with such a difference, nor were they used as a bridge by the teachers to attempt the extensional overlap of word meanings in functional terms shared by themselves and children.

By examining both how mental growth takes place and the ways in which teaching could profitably adapt itself to the process and consequence of that growth and could also help it along, Bruner (1966) defined instruction as the major means of transmitting the knowledge and skills of a culture and the acquired attributes that reflected a learner's expanding powers - especially the important symbolic measures of language, number and logic. More recently, Bruner (1985) pointed out that

The world is a symbolic world in the sense that it consists of conceptually organised, rule-bound belief systems about what exists, about how to get to goals, and about what is valued. There is no way, none, in which a human being could possibly master that world without the aid and assistance of others for, in fact, that world *is* others...The prosthetic devices require them for their use of certain fundamental



skills, notable among them the ability to use the language as an instrument of thought - natural language, and eventually such artificial languages as mathematics,... and especially written language. As Vygotsky said, it is a matter of using whatever one has learned before to get to higher ground next. (p.32)

"The zone of proximal development" was conceptualised by Vygotsky to represent the improvement in performance which was achievable by suitable help from others.

...the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers. (1978, p.86)

This is a perspective of readiness different from that of other theorists, for example, Piaget. Readiness for learning, for Vygotsky, represents not only the state of the child's existing knowledge, but also his capacity to learn and perform with the help of more knowledgeable and more mature people. Vygotsky argues that those who have larger zones of proximal development than others, even when their current levels of performance are similar, can benefit from instruction more, and thereafter make better progress in their mental development and achievement. In Vygotsky's terms, such "co-operatively achieved success" is at the heart of the learning and development of children (Wood, 1988). Vygotsky made a further distinction between the teacher's concepts and children's attempts to conceptualise in explaining the fundamental difficulties facing children in the context of formal instruction at school. The quotation below is given at length as this bridge between spontaneous concepts and formal concepts was so notably missing in most of the teachers' explanations in Taiwan.

All the major mental functions that actively participate in school instruction are associated with the important new foundations of this age, that is, with conscious awareness and volition. These are the features that distinguish all the higher mental functions that develop during this period. Thus, *the school age* is the optimal period for instruction; it is a sensitive period with respect to those subjects that depend on conscious awareness or volition in the mental functions. Instruction in these subjects, therefore, provides the ideal conditions for the development of the higher mental functions, mental functions that are in the zone of proximal development during this period. (1987, p.209, emphases added)

...the characteristics of the school child's spontaneous concepts that remain underdeveloped, lie entirely within his zone of proximal development. They emerge and they become actual, in his collaboration with adults. This is why the development of scientific concepts presupposes a certain level in the development of spontaneous concepts; within the zone of proximal development, conscious awareness and volition appear with these concepts. At the same time, scientific concepts restructure spontaneous concepts. They help move them to a higher level, forming their zone of proximal development. That which the child is able to do in collaboration today, he will be able to do independently tomorrow. (1987, pp.216-217)

The strength of the scientific concept lies in the higher characteristics of concepts, in conscious awareness and volition. That is, in contrast, the weakness of the child's everyday concept. The strength of the everyday concept lies in spontaneous, situationally meaningful, concrete applications, that is, in the sphere of the empirical experience. The development of scientific concepts begins in the domain of conscious awareness and volition. It grows downward into the domain of the concrete, into the domain of personal experience. In contrast, the development of spontaneous concepts begin in the domain of the concrete and empirical. It moves toward the higher characteristics of concepts, toward conscious awareness and volition. The link between two lines of development reflects their true nature. This is the link of the zone of proximal and actual development. (1987, p.216)

In Vygotsky's words, effective formal instruction ensures that the forms of generality embodied in scientific concepts can reconstruct the child's thinking towards higher levels of mental functions.

As a result, the laws that govern this unique form of thought pertain only to the domain of spontaneous concepts. Even as they emerge, the scientific concepts of one and the same child will have different characteristics, characteristics that bear witness to their different nature. Arising from above, from the womb of other concepts, they are born through relationships of generality between concepts that are established in the process of *instruction*. By their very nature, scientific concepts include something of these relationships, some aspect of a system of concepts. The formal discipline of these scientific concepts is manifested in the complete restructuring of the child's spontaneous concepts. This is why the scientific concept is of such extraordinary importance for the history of the child's mental development. (1987, p.236)

Lee (1987) interpreted such a distinction more specifically.

The abstract generality of any scientific concept is based on conceptual equivalences, i.e., its level of generality depends on its place in a system

of concepts established through conscious awareness and control. Spontaneous concepts are characterised by lack of awareness and conscious control and the relation between word and concept is relatively direct...The child develops a conscious awareness of his spontaneous concepts relatively late in the developmental process. Since these concepts are used in his daily activities, they are oriented towards the world and towards the objects to which they refer. The child is not aware of the concept "behind" the object or of the act of thought that represents the object. In contrast, the learning of scientific concepts in formal school settings starts with verbal definition,... "with work on the concept itself," involving "operations that presuppose the non-spontaneous application of this concept." (p.102)

In Chapter 6, children's impressive everyday thinking was noted by the teachers, and yet teachers' instruction was primarily directed towards the conceptual thinking specially amenable to academic matters. The kind of intuitive and context-specific thinking specially sensitive to spontaneous concepts seemed to be suppressed, instead of being transformed into scientific concepts in the ways suggested by Vygotsky.

Particular attention was paid to Mrs U because she alone utilized the pivotal part of instruction in the transition of children's everyday thinking. The importance of sufficient explanations, rehearsals, and immediate feedback on children's performance and results was also illustrated through Mrs U's instructional procedures. Such instruction, however, could only be fully effective if children took an active part in the experience of the tasks. This began by creating their understanding of the tasks and ended with the actual operations. Meanwhile, it was noted that effective instruction also reduced the disturbing effects of children's insufficient and incompatible mental functions in the mode of both cognition and language, and of inappropriate and confusing task elements on children's understanding and performance. The two teachers in the suburban area were seen to exacerbate these individual- and task-related problems by failing to provide adequate explanations and sufficient rehearsals of the tasks for the slower pupils or those with language problems. More notably, in these teachers' classes, most of the children were observed to be *reactive*, rather than *active*, to verbalisations of the surface features and the required operations involved in the tasks. Under these circumstances, as found throughout the prolonged in-depth observations, children making slow progress were found to be too profoundly affected by the disadvantages of their own characteristics and those of the tasks to do the work and make progress to the best of their ability.

Apart from the effects of instruction, Howe (1984) has recognised previous experiences, family life, and social background, as important indirect influences. For him, family life primarily involves the types of environmental stimuli to which children have been exposed. The fieldwork of the present study suggested the profound effects of previous learning experiences which were directed and monitored by the adults by whom children were most influenced: the parents and the kindergarten teacher.

The children in the working class suburban areas were described as having distracting life experiences and attitudes in general, and inadequate and insufficient numeracy and literacy in particular, due to a combination of poor quality kindergarten learning experiences (with special reference to preparatory learning to read in phonetic symbols), and lack of necessary guidance and relevant learning aids offered by disadvantaged parents. With respect to the children from middle class families in urban areas, there were more favourable and sufficient directions from advantaged parents and good quality kindergartens which consolidated and expanded children's general knowledge and basic skills.

Overall, in the interviews, the teachers and parents alike pointed to certain important and necessary discontinuities in intellectual, linguistic, psychological and social experiences of Taiwanese children, which, they believed, caused problems for children entering school. It was implied that instruction was foremost in children's minds and the teacher was in the best position to help children optimise performance levels through their active participation in instruction.

Two major implications of the findings and eight specific points will now be drawn from the overall findings of the study to suggest improvements in reception class teaching in Taiwan. Recognising that the whole ethos of primary education in Taiwan cannot be changed, at least in the foreseeable future, the more child-centred methods from Western primary schools have not been seriously considered. The implications are based on ways of directly improving the existing situation, although it is recognised that, ideally, a more fundamental reappraisal is called for.

### **10.2.2 Implications of the findings for reception classroom instruction**

First, to help children gain access to the tasks, instruction needs to be mainly aimed at achieving the goal of understanding by making direct use of children's existing

knowledge and available strategies, and abilities. Second, to help children overcome their difficulties in going about symbol- and concept-laden tasks, instruction should ensure that there is an overlap between children's spontaneous concepts, the more formal concepts embedded in the learning material, and teachers' verbalised concepts. An integration of these two implications means that these two main objectives have to be achieved in two phases of teaching activity, i.e., pre-lesson and within-lesson.

The pre-lesson instructional activity is mainly intended to facilitate the children's access to the learning tasks. The teacher should already have a firm and accurate grasp of the most important ideas in each subject area she is going to teach. But she needs to be well informed about the developmental course of children's thinking, language, and motivational orientations. It is also essential for the teacher to know how to lead children to develop strategies which allow them to use their existing abilities to greatest effect. In overcoming difficulties in grasping the concepts involved in the learning tasks, the within-lesson instructional activity should be primarily concerned with creating a correspondence between children and teachers in the mental processing of word meanings which represent the concepts to which they refer. In the language-dominated context of the reception class, verbal instruction should ensure a common background of mutual understanding of the end product at the conceptual level by sharing the word meanings in functional terms. Following the above main lines of argument, there are eight key points which demand specific attention and effort in the instruction given by the reception teacher in the classroom.

Firstly, instruction should demonstrate the interconnectedness of information embodied in the academic and natural domains. Secondly, instruction should direct children's attention, in sequence, to the critical elements of the content and the form of the task. Thirdly, instruction depends on effective organisation of knowledge and skills in order to prevent children from relying solely on fragmented, spontaneous, isolated surface features of target representations. Fourthly, instruction should point up clearly and explicitly similarities and differences in representations, components, and inherent demands, as they occur across the varied learning tasks. Fifthly, instruction should progress from surface features to deeper and more principled perceptions of the work undertaken. Sixthly, instruction needs to provide sufficient practice on the actual operations, in

relation to the required knowledge and skills, to ensure that they can be consolidated and automatised sufficiently to be used in the relevant problem contexts. Seventhly, instruction should allow children to take active part in creating meanings, explanations and interpretations of the tasks. This will prevent them from being intellectually lost and overloading their cognitive and linguistic capacities and processes. Finally, instruction needs to lead children to analyse and interpret sensibly the problem contexts, to make choices of strategies for producing the best results, and to reflect on relevant feedback from their performance.

### **10.3 Suggestions**

In the present study the most frequently mentioned problems in the reception class referred to large class size, the inflexibility of the schedule of progress through the learning materials, the shortage of time, and the restrictions in resources. More significantly, the centrally-controlled school system in Taiwan was described as exacerbating the effects of these disadvantages on the work of the teachers and children. In such a system, in which, in the foreseeable future, these systematic disadvantages cannot be removed, the school itself is considered to be in the best position to create a facilitative, constructive, and supportive environment for children to have a good and easy start to school and to optimise the likelihood of progress to the best of their ability. Thus, the following suggestions are made to enable primary schools and reception teachers to achieve such a goal in the immediate future.

#### **10.3.1 Supporting and helping teacher's professional development**

It was suggested, in Chapters 6 and 7, that there is a big gap between teacher education and practical work with school-age children. This gap was described as undermining the teachers' work in general and the effectiveness of teaching in particular. The teachers' comments on this fact pointed to a need to develop four domains of their knowledge and skills so as to improve the effectiveness of classroom practices and teaching. First, it was noted that the teachers' instructions focused mainly on the surface features of the representations incorporated into the textbook matter and workbook tasks. The teachers' confusion, indicated in the interviews, over certain subject matter also suggested a need for accurate and comprehensive ideas on domain-specific matters. Second, in Chapter 7, the teachers

admitted their difficulties and limitations in carrying out instructions. It was pointed out that the subject-specific instruction was primarily built by trial and error on their accumulated experiences of children and subject matter. Such a full recognition implied the necessity of equipping the teachers with sufficient and accurate knowledge of domain-specific matters. Third, in the interviews, the teachers also recognised the negative effects of their lack of understanding and ability to interpret properly the relationship between children's abilities and their performance levels. This disadvantage was described as sufficiently accounting for the ineffectiveness of instruction. Finally, the teachers' emphasis on the disturbing effects of large classes and of many administrative and organisational events on their teaching implied a need for knowledge and techniques of classroom management suitable for children entering school. It was suggested that, primary schools, rather than teacher colleges, are in a better position to design and implement in-service programmes for teacher development specially aimed at the improvement and extension of these four domains of knowledge and skills in terms of teachers' specific needs and problems, and the facilities and resources a school can afford to pursue within the allotted budgets.

As a way of tackling the four main problems identified in the teaching of Taiwanese reception classes, the following suggestions are made for improving the quality of children's learning. First, it is suggested that Taiwanese primary schools should develop and implement school-based in-service programmes specially aimed at enhancing children's understanding of the learning tasks. There are two domains in the suggested content of the programmes: a general and a subject-specific one. The general programme should equip teachers with information resources and techniques which enable them to uncover factors important to children's understanding. This programme could draw from six of the points made by Greeno and Riley (1987) about the nature of understanding and about the tasks for which children's performance would provide indications of the extent and scope of their understanding.

(1) Explicit knowledge...When individuals can state relevant principles and explain why they are relevant, clearly, they are aware of the principles they understand...(2) Conformity... When individuals' performance does conform to a principle, it is possible that they understand the principle...(3) Implicit understanding...An ability to evaluate examples of performance according to the principle - that is, to judge whether or not specific examples are consistent with the principle

or the use of the principle to identify structural properties shared between procedures in different domains, or to solve problems in a domain different from the one in which the procedure was initially acquired...(4) Evaluation of performance...In procedural domains, one kind of understanding of a principle can be tested by presenting examples of performance, and testing whether or not an individual correctly discriminates between examples that are or are not consistent with the principle...(5) Analogical use of mapping of procedures...If the procedure in the known domain can be used in solving the new problem, or can be used to facilitate learning of a new problem-solving procedure, then the basis of that transfer, or new learning, can reasonably be inferred to be understanding of the principle that is shared by the procedures in the two domains...(6) Instructional mapping of procedures...One child was asked how the procedure that had been learned differed from the one the child had used previously...This provides evidence that the general principle shared across the two domains was understood by the child. (pp.291-294)

As far as the domain-specific programme is concerned, reception teachers should develop adequate and sufficient knowledge and skills which would enable them to help children to understand core concepts and to master the procedures specific to subject areas. The findings indicated that children's particular difficulties lay in coding phonetic symbols, grasping formal concepts of mathematics, and applying informative facts and routine practice to language-based problem solving. Thus, it is suggested that domain-specific teacher-development programmes need to cover the information resources and activities empowering teachers' knowledge and techniques for carrying out effective teaching in language and mathematics. It is suggested that three major lines should be undertaken. First, to provide teachers with clear and accurate information about the essence of the subject matter, such as the phonetic system and its relation to Chinese characters, the nature of a zero, the relational concepts of cardinality, the essence of subtraction at the conceptual and operational levels, and so on. Second, to design and carry out model teaching as a demonstration of effective methods specific to certain domains of concepts and procedures. Third, plan and carry out experiments with teaching methods which have been widely adopted in the Western schools in the same areas to explore all possibilities for improving the effectiveness of teaching. For example, Perfetti and Curtis (1986) suggested that a schema theory was appropriate for the instruction of beginning reading. They further pointed out the need to see lexical access as a process important to children's comprehension. They suggested that direct teaching of decoding had much to recommend and it had no harmful side effects. Although there are marked differences between the Chinese and English languages in the



phonetic system, there are common principles at the conceptual and operational levels for increasing the word-identification which leads to comprehension.

In enabling reception teacher to enhance children's understanding of the classroom environment as a whole, Barrett's system- and culture-free suggestions (1986) are very relevant to Taiwanese primary schools. He suggested that the in-service school-based teacher education should be focused on particular issues such as what children actually gained from various kinds of learning materials and lesson activity. Such a teacher-development scheme might also involve workshops in which the teacher would be able, with the support of colleagues, to develop specific skills of observation, analysis of their own classroom practices, and understanding of important needs to be met. The main theme of this kind of in-service education, especially for the reception teachers, would cover information resources and techniques aimed at the identification of six aspects important in creating an understanding of the classroom environment: (1) characteristics and limitations of the organisation and physical layout of the classroom, (2) the daily and weekly timetable, (3) expectations within the classroom, (4) the purposes of the expectations, (5) the organisation of expectations, and (6) pupils' responses to expectations and organisational structures.

Evans (1984) argued that there was an advantage in appointing a group of support teachers specially chosen to help in solving teachers' problems and to support their professional development in school. It was suggested that the school should designate some teachers to be specifically responsible for school-based staff development. These teachers would plan professional courses and studies, ensuring that all information about in-service programmes and opportunities would be available to the teaching staff. More specifically such teachers would be in the best position to help the teaching staff to contact professional consultants, to find information resources and research literature, and to control the overall planning of progress schedules and evaluation. Taiwanese primary schools should follow these principles of selecting reception teacher as members of the support group responsible for the development and implementation of in-service programmes. These support group teachers should be experienced, competent, and dedicated. They would be appointed to be in charge of this kind of teacher-development programme, as far as possible independent of the bureaucratic hierarchy of school administration. Although the content and the form of the

programmes should vary from school to school in order to meet the different school priorities, teachers' needs and viewpoints should be given paramount importance when the programmes are being planned.

### 10.3.2 Setting up child-centred progress schedules

The results of the interviews and observations with children presented in Chapters 6, 7 and 9 indicated that precise progress schedules exacerbated the difficulties and disadvantages the teachers and children had in carrying out the tasks. It seemed rather encouraging that the teachers' autonomy in making choices of units in the textbook and workbook tasks is documented in the official teacher guidelines. Practically speaking, according to the guidelines, teachers are asked *not* to introduce units in textbooks and workbooks which are inappropriate for the children to learn and perform. In reality, however, as the teachers put it, without the Principals' consent and support for this kind of autonomy, all the units incorporated into the textbooks and workbooks had to be completely covered. The teachers' serious and repeated comments on this issue in the interviews indicated an immediate need for Principals to accept flexible progress schedules which could come to terms with the children's individual abilities to learn and the complexity of the tasks.

The 5-14 development programme in Scotland has specified attainment targets and has its special implications for overcoming the disadvantage of quantified and inflexible progress schedules in Taiwanese reception classes. The 5-14 framework is designed to ensure "balance, continuity, coherence and progression" of children's learning and performance by "clearly establishing the most important features of a curriculum area and indicating what is attainable in them." (SED, 1990, p.7) This scheme also outlines "strategies for effective teaching and learning including the assessment of achievements to be shared with pupils, colleagues and parents." (p.7) Achieving the attainment targets set in such a scheme ensures that a pupil's learning will be comprehensive and progressive, as a result of a match between his ability to cover the learning tasks and the attainment levels he is set to reach. This kind of attainment-target scheme also outlines specific activities aimed at leading children to acquire and apply core knowledge and skills categorised as the kernel of learning experiences in terms of children's performance levels.

Since it is impossible in the immediate future in Taiwan to remove or reform the uniform curriculum implemented along with its timetables and progress schedules, it would be reasonable and realistic to categorise each unit of tasks into differentially attainable items and exercises in terms of children's performance levels and the difficulty and complexity of the tasks. For example, the brightest children could be set to complete all the exercises whereas the poorest might do a few simple items and exercises. In other words, children would be required to do the items and exercises they are able to cope with in a period of time given. In ensuring the teachers' accountability, it is suggested that teachers set up this kind of child-centered progress schedule and categorise groups of attainable items and exercises prior to the start of school, and a supervisory group of teachers and school administrators assess the *quality* rather than quantity of the children's work, such as completeness, tidiness, and accuracy in terms of children's attainment levels. In response to the authority-led inspection, the official teacher guidelines undoubtedly can justify such school-based development and implementation of child-centered progress schedules.

### 10.3.3 Increasing parental involvement

Regardless of school catchment areas and focal points of teachers' instruction, the teachers had given overwhelming credit to the parents' role in the children's school performance. It was suggested in Chapter 7 that, irrespective of educational background, children's ever-worsening performance would be beyond teachers' reach and slow progress would come to a virtual halt soon after starting school, unless the parents could undertake four requirements:

1. be with their children or even supervise them to practise the learning outcomes directly or indirectly at home as frequently as they should;
2. be reasonably serious about the children's school education;
3. contact the teachers frequently enough to have accurate and comprehensive understanding of their children's difficulties in making progress in particular; and
4. learn to play constructive and realistic part in children's schooling with the teachers' help.

It was indicated that school-based parental-involvement schemes were needed in order to help parents to be more positively and adequately involved in the development of their children's formal schooling. The parents' experience of their children's discouraging start at school revealed in Chapter 6 also reinforced this need.

In recent years, parental involvement has been strongly suggested, supported and valued in children's primary education and in the earliest year in particular. Barrett (1986) found that parents' early contact with schools and teachers in particular could help them gain understanding of the significance of early childhood education from which their children benefited a great deal. He suggested that education in parenting, with practical experiences of young children, should be part of schooling. Renwick (1984) stressed that parents' feelings of being made welcome at school were very important in the early stage of a child's schooling. For the teachers, she suggested that the greatest benefit in having parents in the class was to have extra adults available to talk and listen to individual children. Central to their visits was the need for parents to understand teachers' expectations of parental involvement and children's performance. More recently, Brayns (1989) found that the more parents knew about children's school and classroom processes, the better progress their children were likely to make. He recognised that performance in infant school was a strong predictor of subsequent educational achievement. He further claimed that parents' familiarity with school in these vital early years was not just important, but essential. Many teachers were surprised at the fact that so many parents of their pupils were teaching their children reading in an entirely inadequate way at home, due to ignorance of what was going on in the classroom. These parents were described as lacking understanding of, or not having been properly told about, suitable teaching methods. Under the circumstances, Brayns suggested that individual schools should develop their own priorities of parent-induction programmes. In his view, the necessary content of such programmes should cover: (1) a description and tour of the school; (2) an introduction to general school organisation, personnel, and resources, (3) a presentation of curriculum objectives and educational aims of the school, classroom organisation, layout, and essential materials; (4) information about general policies and key issues set on the agenda; (5) an outline and description of the school's preferred methods of teaching and its evaluative system; (6) recommendations of specific ways in which parents can support the school, including a commitment to

spend periods of time there during school hours, offering specific skills to the overall curriculum; (7) advice on what to do if things go wrong; and (8) explanations of the methods of reporting pupils' progress.

Reflecting on the above suggestions and the teachers' expectations, parents' conditions, and school situations, described in Chapter 7, it is suggested that primary schools in Taiwan plan and implement parental-involvement schemes for parents whose children are to start school in two phases: pre-entry and post-entry. Pre-entry programmes might consist of: (1) an orientation activity introducing the parents to staff, resources, organisation, management, and policies of the school; (2) information-exchange meetings during which the parents give teachers information about their children's characteristics, previous experiences, physical attributes, and family conditions, and at the same time teachers explain to parents about their expectations about both parental involvement and their children's school performance; and (3) brief demonstrations and explanations of suitable and accurate methods of teaching children the subject matter, and how to read in phonetic symbols in particular. In respect to post-entry programmes, the necessary contents might cover: (1) explanations of the appropriate way of understanding and interpreting the children's performance and results, (2) information about the method of assessing and reporting the children's learning outcomes, (3) suitable methods for helping children with learning difficulties, and (4) demonstrations and explanations of adequate individual-based and subject-specific methods of supervising and teaching children at home.

Clearly, in achieving the goal of school education for the benefit of children, parents, teachers and primary schools need to work together. The present study started with an attempt to answer the major question of why children found school difficult, and many reasons have been identified. This study ends by recognising that the observations made have also drawn attention to other important questions which need to be addressed and answered in the future.

#### **10.4 Further research**

As Wood (1988) found in his review, no other topics in the history of education have raised more disputes, arguments and investigations between different schools of thought than the one about the origins of the differences in educational

achievement of children from different ethnic and social backgrounds. The theoretical formulations and empirical evidence based on great concern with child development have had profound effects on the early years of schooling in particular. Ausubel (1959) described these effects as being embodied in several critical aspects. First, belief and implementation of a fixed mandatory age of school entry is assumed as optimal for every kind of learning and performance in school. Then, children's cognitive maturity is thought necessary before it is possible for them to grasp various domains of subject matter. Finally, he stressed the emphasis on children's existing interest.

On the other hand, premature and wholesale extension of developmental principles to educational theory and practice has caused incalculable harm. It will take at least a generation for teachers to unlearn some of the more fallacious and dangerous of these over-generalised and unwarranted applications. (p. 246)

He further suggested that "...Before the educational implications of developmental findings can become explicitly useful in everyday school situations, much additional research at the beginning level of operations is necessary." (p.246) Many popular generalisations in child development, such as the notion of readiness, in Ausubel's words, "...are interesting and potentially useful ideas to curriculum specialists but will have little practical utility in designing a social studies or physical education curriculum unless they are rendered more specific in terms of the actual operations involved in teaching these subjects." (p. 246)

Having shared Ausubel's serious concerns for empirical research into specific subjects at the beginning level of operations, the present study focused on the children's performance in the subjects of language and mathematics. Further investigations of children's difficulties in going about the learning tasks in all subject areas would prove fruitful. It would be specially worthwhile to explore any differences between those who are best prepared and least prepared in all kinds of school performances across all subject areas, and across the four academic subjects in particular.

According to the survey by West and Varlaam (1990), neither the children's age nor the amount of schooling received ensured a high level of school performance. Instead, they found that pre-school education was an "overriding" factor. The present study also indicated the profound effects of pre-school experiences. Further

carefully planned longitudinal research would be most welcome if it allowed a close examination of children's learning outcomes in pre-school institutions and everyday experiences prior to the outset of school. It is clearly necessary to relate the identified differences in learning experiences, to both the extent and scope of parental involvement and children's difficulty in making progress at school.

Since it was found that the majority of school-age children had substantial difficulties in going about the subject matter and tasks in phonetic symbols, while they could make rapid progress in comparable aspects in Chinese characters, it is essential to explore differences in the teacher's domain-specific knowledge and understanding, teaching methods, and children's learning outcomes and related performance along these two different written modes. It would be very interesting to look at the relationship between (1) the nature and properties of the Chinese language in two written modes, i.e. the phonetic symbols and characters, (2) school language including the content and the structure of the language textbook and workbook, language demands involved in all learning materials, components and functions of teachers' instructional language and language-teaching practices, (3) children's home language, the knowledge and skills of language, and (4) children's experiences and perceptions of learning, performance, results, and achievement specific to language.

In Taiwan, research into children's experiences of formal schooling is a vast land in which enormous areas are left untouched. It is very important to continue to explore this area using the qualitative approach which had been shown in the present study to be specially appropriate for research on the early years of schooling.

However unsatisfactory the current situation in reception education in Taiwan, the present study has achieved the goal of bringing a long-ignored reality to light, addressing important issues worthy of more attention and suggesting further efforts to maximise the likelihood of children's optimum progress. It has done this in four main ways by

1. portraying authentically the contextual demands and situational disadvantages undermining the work of teachers and children;

2. identifying plausible and specific causes of children's difficulties;
3. indicating holistically the effects of the interaction between children's abilities, the learning tasks, and the teachers' instruction; and
4. suggesting practical and feasible remedies for a situation which seems to be wholly disadvantageous to children entering school.

Children do not ask to go to school. Neither should they take the full blame for their poor performance. These problems have their roots in socio-cultural- and situation-bound disadvantages in the many aspects found in the present study. It is with goodwill and enthusiasm that they go to school in the first place. But, there, for the most part, they have to cope on their own with an unnaturally structured package of learning programmes and encounters.

Here is the heart of the matter. By the time they come to school, all normal children can show skills as thinkers and language-users to a degree which must compel our respect, so long as they are dealing with 'real-life' meaningful situations in which they have purposes and intentions and in which they can respond to purposes and intentions in others. (Donaldson, 1978, p.121)

There is little doubt that human development involves a continuous process of becoming more able properly to perceive, make use of, and respond to the world. Nevertheless, sudden changes do create difficulties. It is too hard for anyone to achieve optimum adaptation to very unfamiliar encounters without other people's help, far less those who start with great disadvantages. Starting school is a case in point.

For children, going to school is a new and special occasion that requires them to make sense of an adult-centred and symbol-laden world. Their everyday skills in cognition and language alone certainly cannot ensure a smooth and successful transition to school, nor do these proficiencies enable them to take advantage of reception education, before having to develop the additional skills required for school success. Although there must be important discontinuities in the experiences of children as they begin formal schooling, education is aimed at empowering children to solve problems adequately and sensibly in a relevant context. To achieve such a goal, children's abilities and skills need to be consolidated and expanded in a more rational, elaborate, and transferable way



through effective instruction. It has been clearly shown that children's participation in school encompasses marked qualitative shifts with intellectual functions, linguistic processing, attitudes, behaviour, and so on. Confronted with problems during the transition process, and the demands stemming from the new situation in school, inexperienced children need more help and assistance from teachers and parents to make optimal progress, even though they have proved themselves to be independent thinkers, good language-users, and energetic actors in the everyday world. Above all, children need teachers' empathetic understanding of their difficulties if those teachers are to be able to help them tackle learning tasks more effectively.

## REFERENCES

- Ahr, E. A. (1967) 'Early School Admission: One District Experience'. *Elementary School Journal*, 67, 231-236.
- Alexander, R. J. (1984) *Primary Teaching*. London: Holt Rinehart & Winston.
- Atkinson, P., Delamont, S. & Hammersley, M. (1988) 'Qualitative Research Traditions: A British Response to Jacob'. *Review of Educational Research*, 58, 231-250.
- Ausubel, D. P. (1959) 'Viewpoints from Related Disciplines: Human Growth and Development'. *Teacher's College Record*, 60, 245-254.
- Ausubel, D. P. (1968) *Educational Psychology: A Cognitive View*. New York: Holt, Rinehart Winston.
- Ausubel, D. P., Sullivan, E. V. & Ives, S. W. (1980) *Theory and Problems of Child Development*. (3rd ed) New York: Grune & Stratton.
- Bakan, D. (1972) 'Psychology can now Kick the Science Habit'. *Psychology Today*, 11, 26-28, 87-88.
- Bakker, D. J. (1967) 'Temporal Order, Meaningfulness and Reading Ability'. *Perceptual and Motor Skills*, 24, 1027-1030.
- Barton, L. & Walker, S. (1978) 'Sociology of Education on the Crossroads' *Educational Review*, 30, 269-283.
- Barrett, G. (1986) *Starting School: An Evaluation of the Experience- Final Report of An Evaluation of Responses of Reception Children to School*. The Assistant Masters and Mistress Association.
- Bee, H. (1985) *The Developing Child*. (4th ed) New York: Harper & Row.
- Bennett, N., Desforages, C., Cockburn, A. & Wilkinson, B. (1984) *The Quality of Pupil Learning Experiences*. London: Erlbaum.
- Bennett, N. (1990) 'Teaching and Learning in the Primary Classrooms'. N. J. Entwistle (Ed.), *Handbook of Educational Ideals and Practices*. London: Routledge & Kegan Paul.
- Biddle, B. J. (1967) 'Methods and Concepts in Classroom Research'. *Review of Educational Research*, 37, 337-357.
- Biemiller, A. (1970) 'The Development of the Use of Graphic and Contextual Information as Children Learn to Read'. *Reading Research Quarterly*, 6, 76-96.
- Blair, G. M., Stewart, J. R., & Simpson, R. H. (1975) *Educational Psychology*. (4th ed) New York: Macmillan.

- Blank, M., Rose, S. A. & Berlin, L. J. (1978) *The Language of Learning: The Preschool Years*. London: Grune & Stratton.
- Blenkin, C. (1988) 'Education and Development: Some Implications for the Curriculum in the Early Years'. A. Blyth (Ed.) *Informal Primary Education Today: Essays and Studies*. London: Falmer.
- Blenkin, C. M. & Kelly, A. V.(1987) *The Primary Curriculum: A Process Approach to Curriculum Planning*. (2nd ed) London: Harper and Row.
- Bloom, B. S. (1976) *Human Characteristics and School Learning*. New York: McGraw-Hill.
- Blyth, A. (1988) 'Five Aspects of Informality in Primary Education'. A. Blyth, (Ed.) *Informal Primary Education Today: Essays and Studies*. London: Falmer.
- Blumer, H. (1969) *Symbolic Interactionism*. Englewood Cliffs, New Jersey: Prentice-Hall
- Blumenfeld, P. C., Mergendoller, J. R. & Swarthout, D. W. (1987) 'Task as a Heuristic for Understanding Student Learning and Motivation'. *Journal of Curriculum Studies*, 19, 135-148.
- Boehm, A. E. & Weinberg, R. A.(1977) *The Classroom Observer: A Guide for Developing Observation Skills*. New York: Teachers College Press.
- Bogdan, R. C. & Taylor, S. J. (1975) *Introduction to Qualitative Research Methods*. New York: John Wiley & Sons.
- Bogdan, R. C. & Biklen, S. K. (1982) *Qualitative Research for Education: An Introduction to Theory and Methods*. Boston: Allyn & Bacon.
- Bond, G. L., Tinker, M. & Wasson, B. B. (1979) *Reading Difficulties: The Diagnosis and Correction* (4th ed) Englewood, Cliffs: Prentice-Hall.
- Braga, J. L. (1969) 'Analysis and Evaluation of Early Admission to School for Mentally Advanced Children'. *Journal of Educational Research*, 63, 103-106.
- Braga, J. L. (1971) 'Early Admission: Opinion versus Evidence'. *Elementary School Journal*, 72, 35-46.
- Brenner, M. (1985) 'Intensive Interviewing'. M. Brenner, J. Brown and D. Canter (Eds.) *The Research Interview: Uses and Approaches*. London: Academic Press.
- Brenner, M., Brown, J. Canter, D. (1985) 'Introduction'. M. Brenner, J. Brown and D. Canter (Eds.) *The Research Interview: Uses and Approaches*. London: Academic Press.
- Brown, A. L., Bransford, J. D., Ferrara, R. A. & Campione, J. C. (1983) 'Learning, Remembering and Understanding'. J. E. Flavell & E. M. Markman (Eds.) *Cognitive Development* New York: John Wiley & Sons.

- Brownell, W. A. (1941) *Arithmetic in Grades I and II: A Critical Summary of New and Previously Reported Research*. Duke University Research Studies in Education, 5, Durham: Duke University Press.
- Bruner, J. (1960) *The Process of Education*. Cambridge, Massachusetts: Harvard University Press.
- Bruner, J. (1966) *Toward a Theory of Instruction*. Cambridge, Massachusetts: Harvard University Press.
- Bruner, J. (1985) 'Vygotsky: A Historical and Conceptual Perspective'. J. V. Wertsch (Ed.) *Culture, Communication, and Cognition: Vygotskian Perspectives*. Cambridge: Cambridge University Press.
- Brayns, T. (1989) 'Parental Involvement in Primary Schools: Contemporary Issues'. S. Wolfendale (Ed.) *Parental Involvement: Developing Networks between School, Home and Community*. London: Cassell.
- Bryant, P. & Bradley, L. (1985) *Children's Reading Problems: Psychology and Education*. Oxford: Basil Blackwell.
- Campbell, R. J. (1985) *Developing the Primary School Curriculum*. London: Holt, Rinehart & Winston.
- Carpenter, T. P. & Moser, J. M. (1983) 'The Acquisition of Addition and Subtraction Concepts'. R. Lesh & M. Landau (Eds.) *Acquisition of Mathematics Concepts and Processes*. New York: Academic Press.
- Carlson, R. O. (1964) *Environmental Constraints and Organisational Consequence: The Public School and its Clients*. 63rd Yearbook National Society for Study of Education. Chicago: University of Chicago Press.
- Chaffee F. H., Aurell, G. E., Barth, H. A., Cort, A. S., Dombrowski, J. H. Fasano, V. J. Weaver, J. O. (1969) *Area Handbook for the Republic of China* U.S. Government Printing Office.
- Chall, J. (1967) *Learning to Read: The Great Debate*. New York: McGraw-Hill.
- Chen, C. C. (1966) *History of Chinese Education*. Taipei: Shunwoo.
- Chen, T. H. (1981) 'The Educational System'. J. C. Hsiung and others (Eds.) *Contemporary Republic of China: The Taiwan Experience 1950-1980*. New York: American Association for Chinese Studies.
- Child, D. (1987) *Psychology and the Teacher*. (4th ed) London: Cassell.
- Clarizio, H. F., (1977) 'Natural versus Accelerated Readiness' H. F. Clarizio et al (Eds) *Contemporary Issues in Educational Psychology*. (3rd ed) Boston: Allyn & Bacon.
- Clark, M. M. & Cheyne, W. M. (1979) *Studies in Pre-school Education*. London: Hodder & Stoughton.

- Cleave, S., Jowett, S. & Bate, M. (1981) *And So To School: A Study of Continuity from Pre-school to Infant School*. NFER-Nelson.
- Cockburn, A. (1986) *An Empirical Study of Classroom Processes in Infant Mathematics Education*. unpublished Ph.D. thesis, University of East Anglia.
- Cronbach, L. J. (1977) *Educational Psychology*. (3rd ed) New York: Harcourt Brace.
- Damon, W. (1977) *The Social World of The Child*. London: Jossey-Boss.
- Davis, R. (1988) 'Introduction'. R. Davis, M. Golby, W. Kernig, & J. Tamburrini (Eds.) *The Infant School: Past, Present and Future* London: Institute of Education, University of London.
- De Cecco, J. P. (1968) *The Psychology of Learning and Instruction: Educational Psychology*. Englewood Cliffs, New Jersey: Prentice-Hall.
- De Landsheere, G. (1985) 'History of Educational Research'. T. Husen and T. N. Postlethwaite (Eds.) *International Encyclopedia of Education*, 3, 1588-1596, Oxford: Pergamon.
- De Lemos, M. M. (1977) 'Piagetian Theory and The Concept of Readiness'. *Australian Journal of Early Childhood*, 2, 34-39.
- De Lemos, M. M. (1979) 'Studies of School Readiness and School Achievement'. *Australian Journal of Early Childhood*, 4, 10-13.
- Denzin, N. K. (1978) *The Research Act: A Theoretical Introduction to Sociological Methods*. New York: McGraw-Hill.
- Desforges, C. (1990) 'Understanding Tasks In Infant Classrooms'. N. J. Entwistle (Ed.) *Handbook of Educational Ideals and Practices*. London: Routledge & Kegan Paul.
- Desforges, C. & Cockburn, A. (1987) *Understanding the Mathematics Teacher: A Study of Practice in First Schools* London: Falmer.
- Deutscher, I. (1966) 'Words and Deeds: Social Science and Social Policy'. *Social Problems* 13, 233-254.
- Dewey, J. (1938) *Experience and Education*. New York: Macmillan.
- Dexter, L. A. (1970) *Elite and Specialised Interviewing* Evanston, Northwestern University Press.
- Dickson, L., Brown, M. & Gibson, O. (1984) *Children Learning Mathematics: A Teacher's Guide to Recent Research*. New York: Holt, Rinehart and Winston.
- Donaldson, M. (1978) *Children's Minds*. London: Fontana.
- Donaldson, M. (1985) 'The Mismatch between School and Children's Minds'. N. J. Entwistle (Ed.) *Directions in Educational Psychology 1. Learning and Teaching*. London: Falmer.

- Donaldson, M. (1987) 'The Origins of Inference'. J. Bruner, & H. Haste (Eds.) *Making Sense: The Child's Construction of the World* London: Methuen.
- Douglas, J. D. (1976) *Investigative Social Research*. Beverly Hills, California: Sage.
- Doyle, W. (1977) 'Paradigm for Research on Teacher Effectiveness'. L. Shulman (Ed.) *Review of Research in Education*. Itasca, ILL:F.E.: Peacock.
- Doyle, W. (1979) 'Classroom Tasks and Students Abilities'. P. L. Peterson & H. J. Walberg (Eds.) *Research on Teaching: Concepts, Findings and Implications*. Berkeley: McCutchan.
- Doyle, W. (1983) 'Academic Work'. *Review of Educational Research*, 53, 159-99.
- Doyle, W. (1986) 'Classroom Organisation and Management'. M. Wittrock (Ed.) *Handbook of Research on Teaching* New York: Macmillan.
- Downing, J. (1979) *Reading and Reasoning* New York: Springer-Verlag.
- Downing, J. (1984) 'Task Awareness in the Development of Reading Skill'. J. Downing & R. Valtin (Eds.) *Language Awareness and Learning to Read*. New York: Springer-Verlag.
- Dunkel, H. B. (1972) 'Wanted: New Paradigms and A normative Base for Research'. L. G. Thomas (Ed.) *Philosophical Redirection of Educational Research*. Chicago: University of Chicago Press.
- Eggleston, J. (1979) (Ed.) *Teacher Decision-making in the Classroom*. London: Routledge & Kegan Paul.
- Elbaz, F. (1983) *Teaching Thinking: A Study of Practical Knowledge*. London: Croom Helm.
- Entwistle, N. J. (1990) 'Introduction: Changing Conceptions of Learning and Teaching'. N. J. Entwistle (Ed.) *Handbook of Educational Ideals and Practices*. London: Routledge & Kegan Paul.
- Evans, G. (1984) 'The School as a Centre of Professional Development'. M. Skilbeck (Ed.) *Readings in School-based Curriculum Development*. London: Harper & Row.
- Filstead, W. J. (1970) *Qualitative Methodology*. Chicago, IL: Markham.
- Flanvell, J. H. & Wellman, H. M. (1977) 'Metamemory'. R. V. Kail, Jr. & J. W. Hagen (Eds.) *Perspectives on the Development of Memory and Cognition*. Hillsdale, New Jersey: Erlbaum.
- Francis, H. (1982) *Learn to Read*. London: George Allen & Unwin.
- Francis, H. (1985) 'Reading Development in School'. N. Bennett & C. Desforges (Eds.) *Recent Advances in Classroom Research*. Edinburgh: Scottish Academic Press.

- French J. (1987) 'Language in the Primary Classroom'. S. Delamont (Ed.) *The Primary School Teacher*. London: Falmer.
- Fries, C. C. (1963) *Linguistics and Reading*. New York: Holt, Rinehart & Winston.
- Galton, M., Simon, B., & Croll, P. (1980) *Inside the Primary Classroom*. London: Routledge & Kegan Paul.
- Gesell Institute (1987) 'The Gesell Institute Responds'. *Young Children*, Jan. 7-9.
- Ginsburg, H. P. (1977) *Children's Arithmetic: The Learning Process*. New York: Van Nostrand.
- Ginsburg, H. P. (1983) 'Introduction'. H. G. Ginsburg (Ed.) *The Development of Mathematical Thinking*. London: Academic Press.
- Glaser, B. G. & Strauss, A. L. (1967) *The Discovery of Grounded Theory: Strategies for Qualitative Research*. New York: Aldine.
- Glenn, J. A. (1977) *Teaching Primary Mathematics: Strategy and Evaluation*. London: Harper & Row.
- Goodman, K. S. (1974) 'Effective Teachers of Reading Know Language and Children'. *Elementary English*, 51, 823-828.
- Gordon, N. J. (1982) 'Readiness'. H. E. Mitzel (Ed.) *Encyclopedia of Educational Research*. (5th ed) 3, 1531-1535. New York: The Free Press.
- Gough, P. B. & Hillinger, M. L. (1980) 'Learning to Read'. *Bulletin of The Orton Society*, 30, 179-196.
- Gowin, D. B. (1972) 'Is Educational Research Distinctive?'. L. G. Thomas (Ed.) *Philosophical Redirection of Educational Research*. Chicago: University of Chicago Press.
- Gowin, D. B. (1973) 'Artifactual Regularities in Educational Research'. Paper presented at the Annual Meeting of American Educational Research Association, New Orleans, Mimeo.
- Gredler, G. R. (1973) 'Readiness to School: A Look at some critical Issues'. M. M. Clark & A. Milne (Eds.) *Reading and Related Skills*. London: Ward Lock Education: United Kingdom Association.
- Greeno, J. G. & Riely, M. S. (1987) 'Processes and Development of Understanding'. F. E. Weinert & R. H. Kluwe (Eds.) *Metacognition, Motivation, and Understanding*. Hillsdale, New Jersey: Erlbaum.
- Guba, E.G & Lincoln, Y.S. (1981) *Effective Evaluation*. San Francisco. Jasey-Bass.
- Grove, R. W. (1988) 'An Analysis of the Constant Comparative Method'. *Qualitative Studies in Education*, 1, 273-279.

- Hammersley, M. & Atkinson, P. (1983) *Ethnography: Principles in Practice*. London: Tavistock.
- Hatano, G. (1990) 'Commentary'. H. W. Stevenson, & S.-Y. Lee *Context of Achievement*. Monographs of the Society for Research in Child Development, 55, 1-2, 108-115. Chicago: Chicago University Press.
- Hedges, W. (1978) 'At what Age should Children Enter First Grade? A Comprehensive Review of the Research'. Paper presented at the Annual Meeting of the American Educational Research Association, Toronto, Canada, PS 009 825.
- Henderson, L. (1982) *Orthography and Word Recognition*. London: Academic Press.
- Heron, J. (1981) 'Philosophical Bases for a New Paradigm'. P. Reason & J. Rowan (Eds.) *Human Inquiry: A Sourcebook of New Paradigm Research*. New York: John Wiley & Sons.
- Hesse, M. (1980) *Revolutions and Reconstructions in the Philosophy of Science*. The Harvester Press.
- Hiebert, J. (1984) 'Children's Mathematics Learning: The Struggle to Learning to Link Form and Understanding'. *The Elementary School Journal*, 84, 497-513.
- Hilgard, E. R. (1958) *Theories of Learning* London: Methuen.
- Hilgard, E. R., Atkinson, R. C. & Atkinson, R. L. (1971) *Introduction to Psychology*. (5th ed) New York: Harcourt Brace Jovanovich.
- Ho, L. C. (1986) (Ed.) *Republic of China: A Reference Book* Taipei: Hilit.
- Holsti, O. R. (1969) *Content Analysis for the Special Sciences and Humanities*. Reading, Massachusetts: Addison-Wesley.
- Hoosain, R. (1986) 'Language, Orthography and Cognitive Processes: Chinese Perspectives for the Sapir-Whorf Hypothesis'. *International Journal of Behaviour Development*, 9, 507-525.
- Howe, M. J. A. (1984) *A Teacher's Guide to the Psychology of Learning*. Oxford: Basil Blackwell.
- Hsu, F. L. K. (1967) *Under the Ancestor's Shadow*. Garden City, New York: Anchor.
- Hsu, C. (1981) 'Cultural Values and Cultural Continuity'. J. C. Hsiung and others (Eds.) *Contemporary Republic of China: The Taiwan Experience 1950-1980*. New York: The American Association for Chinese Studies.
- Husen, T. (1985) 'Research Paradigms in Education'. T. Husen & T. N. Possethwaite (Eds.) *International Encyclopedia of Education*, 7, 4335-4338, Oxford: Pergamon.
- Hughes, M., Pinkerton, G. & Plewis, I. (1979) 'Children's Difficulties on Starting Infant School'. *Journal of Child Psychology and Psychiatry*, 20, 187-196.



- Hughes, M. (1983) 'What is Difficulty about Arithmetic'. M. Donaldson, R. Grieve & C. Partt (Eds.) *Early Childhood Development and Education*. Oxford: Basil Blackwell.
- Hughes, M. (1986) *Children and Number: Difficulties in Learning Mathematics*. Oxford: Basil Blackwell.
- Hung, D. L. & Tzeng, O. J. L. (1981) 'Orthographic Variations and Visual Information Processing'. *Psychological Bulletin*, 90, 377-414.
- Hymes, J. J. (1958) *Before the Child Reads*. Evanston, Illinois: Row, Peterson.
- Ilg, F. L. & Ames, L. B. (1972) *School Readiness: Behavior Tests Used at the Gesell Institute*. New York: Harper & Row.
- Jensen, A. R. (1973) *Educability and Group Differences*. New York: Harper & Row.
- Kagan, J. (1984) *The Nature of The Child*. New York: Basic Books.
- Kallos, D. (1980) 'On Educational Phenomena and Educational Research'. W. B. Dockrell & D. Hamilton (Eds.) *Rethinking Educational Research*. London: Hodder & Stoughton.
- Kenneth, K. (1986) *Language of the World*. (Rev. ed) London: Routledge & Kegan Paul.
- King, R. (1978) *All Things Bright and Beautiful: A Sociological Study of Infants' Classrooms*. Chichester: John Wiley & Sons.
- Klein, A. & Starkey, P. (1988) 'Universals in Development of Early Arithmetic Cognition'. G. Saxe & M. Gearhart (Eds.) *Children's Mathematico*. San Francisco: Jossey-Bass.
- Kohlberg, L. (1968) 'Early Education: A Cognitive-developmental View'. *Child Development*, 39, 1013-1062.
- Kohlberg, L. & Mayer, R. (1972) 'Development as the Aim of Education', *Harvard Educational Review*, 42, 449-496.
- Kohlberg, L. & others (1987) *Child Psychology and Childhood Education: A Cognitive-Development View*. New York: Longman.
- Layton, J. R. (1979) *The Psychology of Learning to Read*. New York: Academic Press.
- Lee, B. (1987) 'Recontextualizing Vygotsky'. M. Hickmann (Ed.) *Social and Functional Approaches to Language and Thought*. London: Academic Press.
- Lee, D. (1974) *Plato: The Republic*. (trans.) Penguin Books.
- Lew, W. J. F. (1981) 'The Educational Ladder'. J. C. Hsiung and others (Eds.) *Contemporary Republic of China: The Taiwan Experience 1950-1980*. New York: The American Association for Chinese Studies.

- Lincoln, Y. S. & Guba, E. G. (1985) *Naturalistic Inquiry*. California: Sage.
- Lindzey, G., Hall, C. & Thompson, R. F. (1975) *Psychology*. New York: Worth.
- Lindgren, H. C. (1980) *Educational Psychology in Classroom*. (6th ed) New York: Oxford University Press.
- Locke, L. F. (1986) 'The Question of Quality in Qualitative Research'. Paper presented at the Measurement and Evaluation Symposium, Boston Rouge, Los Angeles, ED 283 869.
- Lofland, J. (1976) *Doing Social Life*. New York: Wiley.
- Lumley, F. A. (1976) *The Republic of China Under Chiang Kai-shek: Taiwan Today*. London: Barrie & Jenkins.
- Marjoribanks, K. (1985) 'Interaction Effects'. T. Husen & T. N. Posetlethwaite (Eds.) *International Encyclopedia of Education*, 5, 2622-2631, Oxford: Pergamon.
- Marton, F. (1981) 'Phenomenography- Describing Conceptions of the World Around Us'. *Instructional Science*, 10, 177-120.
- Marton, F. (1986) 'Phenomenography- A Research Approach to Investigating Different Understandings of Reality'. *Journal of Thought*, 21, 28-49.
- Marton, F. & Neuman, D. (draft paper) 'The Perceptibility of Numbers and The Origin of Arithmetic Skills'. Department of Education and Educational Research, Gothenburg University, Gothenburg.
- Mathison, S. (1988) 'Why Triangulate?'. *Educational Researcher*, March, 13-17.
- Mattingly, I. G. (1972) 'Reading, the Linguistic Process, and Linguistic Awareness. J. F. Kavanagh & I. G. Mattingly (Eds.) *Language by Ear and by Eye*. Cambridge, Massachusetts: MIT Press.
- Mattingly, I. G. (1979) 'Reading, Linguistic Awareness and Language Acquisition'. Paper presented at Research Seminar on Linguistic Awareness and Learning to Read, International Reading Association, University of Victoria.
- Matza, D. *Becoming Deviant*. Englewood Cliffs, New Jersey: Prentice-Hall.
- McDaniel, M. A., Einstein, G. O. & Lollis, T. (1988) 'Qualitative and Quantitative Considerations in Encoding Difficulty Effects'. *Memory and Cognition* 16, 8-14.
- McNamara, D. (1980) 'The Outsider's Arrogance: The Failure of Participant Observer to Understand Classroom Events'. *British Educational Research Journal*, 6, 113-125.
- McCarthy, D. J. (1955) 'Pre-entrance Variables and School Success of Under-age Children'. *Harvard Educational Review*, 25, 266-269.

- McLeod, J. Markowsky, M. D. & Leong, C. K. (1972) 'A Follow-up Early Entrants to Elementary Schools'. *The Elementary School Journal*, October, 11-19.
- Meisels, S. J.(1987a) 'Uses and Abuses of Developmental Screening and School Readiness Testing'. *Young Children*, Jan. 4-6.
- Meisels, S. L.(1987b) 'But Dr.Meisels is not Convinced'. *Young Children*, Jan. 8-9.
- Miles, M. B. & Huberman, A. M. (1984) *Qualitative Data Analysis*. Beverly Hills California: Sage.
- Ministry of Education (1989) *Educational Statistics of Republic of China*. Taipei.
- Mitroff, I. I. & Kilmann, R. H. (1978) *Methodological Approaches to Social Science*. San Francisco: Jossey-Bass.
- Moore, R. S. & Moore, D. N. (1975) *Better late than Early*. New York: Reader's Digest Press.
- Morine-Dershimer, G. (1985) *Talking, Listening, and Learning in Elementary Classroom*. New York: Longman.
- Mussen, P. H. (1983) (Ed.) *Handbook of Child Psychology*. (4th ed) New York: John Wiely & Sons.
- Nash, R. (1973) *Classroom Observed*. London: Routledge & Kegan Paul.
- Neumann, K. (1987) 'Quantitative and Qualitative Approaches in Educational Research- Problems and Examples of Controlled Understanding through Interpretive Methods'. *International Review of Education*, 33, 159-170.
- Norman, J. (1988) *Chinese*. Cambridge: Cambridge University Press.
- Oberg, A. (1987) 'Using Construct Theory As a Basis for Research into Teacher Professional Development.' *Journal of Curriculum Studies*, 19, 55-65.
- Patton, M. Q. (1978) *Utilization-focused Evaluation*. Beverly Hills, California: Sage.
- Patton, M. Q. (1980) *Qualitative Evaluation Methods*. Beverly Hills, California: Sage.
- Pearson, P. D. (1984) (Ed.) *Handbook of Reading Research*. (2nd ed) New York: Longman.
- Perfetti, C. A. & Curtis, M. E. (1986) 'Reading'. R. F. Dillon & R. J. Sternberg (Eds.) *Cognition and Instruction*. London: Academic Press.
- Perera, K. (1982) 'The Language Demands of School Learning'. R. Carter (Ed.) *Linguistics and The Teacher*. London: Routledge & Kegan Paul.
- Phillips, C. J., Stott, D. H., & Birrell, H. V. (1987) 'The Effects of Learning Style on Progress towards Literacy and Numeracy'. *Educational Review*, 39, 31-40.
- Piaget, J. (1952) *Children's Conception of Number*. London: Routledge & Kegan Paul.

- Piaget, J. (1953) 'How Children Form Mathematics Concepts'. *Scientific American*, 189, 74-79.
- Piaget, J. (1970) *The Science of Education and the Psychology of the Child*. New York: Orion Press.
- Piaget J. & Inhelder, B. (1969) *The Psychology of the Child*. New York: Basic Books.
- Pidgeon, D. A. (1979) 'Why Put the Cart before the Horse'. D. Thackray (Ed.) *Growth in Reading*. London: Wark Lock.
- Pidgeon, D. A. (1984) 'Theory and Practice in Learning to Read'. J. Downing, J. & R. Valtin (Eds.) *Language Awareness and Learning to Read*. New York: Springer-Verlag.
- Pope, M. L. (1982) 'Personal Construction of Formal Knowledge'. *Interchange*, 13, 3-14.
- Pope, M. L. & Keen, T. R. (1981) *Personal Construct Psychology and Education*. London: Academic Press.
- Pramling I. (1981) *The Child's Conception of Learning*. Goteborg: Acta Universitatis.
- Reese, W. L. (1980) *Dictionary of Philosophy and Religion*. Atlantic Highlands, New Jersey: Humanities.
- Reeve, R. A. (1987) 'Everyday and Academic Thinking: Implications for Learning and Problem Solving'. *Journal of Curriculum Studies* 19, 123-133.
- Reid, J. F. (1972) *Reading: Problems and Practices*. Ward Lock Educational.
- Reid, J. F. (1983) Into Print: Reading and Language Growth. M. Donaldson et al. (Eds.) *Early Childhood Development and Education*. Oxford: Basil Blackwell.
- Reily, R. R. & Lewis, E. L. (1983) *Educational Psychology: Applications for Classroom Learning and Instruction*. New York: Macmillan.
- Renwick, M. (1984) *To School at Five: The Transition from Home or Pre-school to School*. Wellington: NZCER.
- Resnick, L. B. & Ford, W. W. (1984) *The Psychology of Mathematics for Instruction*. London: Erlbaum.
- Resnick, L. B. (1987) 'Instruction and the Cultivation of Thinking'. E. De Corte et al. (Eds.) *Learning and Instruction: European Research in an International Context: Volume 1*. Oxford: Pergamon.
- Reynolds, D. (1980/81) 'The Naturalistic Method of Educational and Social Research'. *Interchange*, 11, 77-89.
- Robinson, H. F. (1985) 'School Readiness'. T. Husen & T. N. Postlethwaite (Eds.) *International Encyclopedia of Education*, 8, 4439-4442, Oxford: Pergamon.

- Salzberger-Wittenberg, I., Henry, G. & Osborne, E. (1983) *The Emotional Experience of Learning and Teaching*. London: Routledge & Kegan Paul.
- Schmidt, W. H. O. (1973) *Child Development: The Human, Cultural and Educational Context*. New York: Harper & Row.
- Schutz, A. (1967) *The Phenomenology of the Social World*. Evanstone, Illinois: Northwestern University Press.
- Schwartz, H & Jacobs, J. (1979) *Qualitative Sociology: A Method to the Madness*. New York: The Free Press.
- Scottish Education Department (1990) 'English Language 5-14: Curriculum and Assessment in Scotland'. Working Paper, March, 2.
- Sharp, R. & Green, A. (1975) *Education and Social Control*. London: Routledge & Kegan Paul.
- Shavelson, R. J. & Stern, P. (1981) 'Research on Teachers' Judgments, Decisions, Pedagogical Thought and Behavior'. *Review of Educational Research*, 51, 455-498.
- Shepard, L. A. & Smith, M. L. (1986) 'Synthesis of Research on School Readiness and Kindergarten Retention'. *Educational Leadership*, Nov., 78-86.
- Shuy, R. W. (1984) 'Language as a Foundation for Education: The School Context'. *Theory into Practice*, 23, 167-174.
- Simpson, R. J. & Galbo (1986) 'Interaction and Learning: Theorizing on the Art of Teaching'. *Interchange*, 17, 37-51.
- Smith, F. (1971) *Understanding Reading - A Psycholinguistic Analysis of Reading and Learning to Read*. New York: Holt, Rinehart & Winston.
- Smith, M. L. & Kleine, P. L. (1986) 'Qualitative Research and Evaluation: Triangulation and Multimethods Reconsidered'. D. D. Williams (Ed.) *Naturalistic Evaluation: New Directions for Program Evaluation*. San Francisco: Jossey-Bass.
- Southgate, V. (1972) *Beginning Reading*. London: University of London Press.
- Spradley, J. P. (1979) *The Ethnographic Interview*. New York: Holt, Rinehart & Winston.
- Stake, R. (1977) 'Some Alternative Presumptions'. *Evaluation News*, 18-19.
- Stevenson, H. W., Stigler, J. W. & Lucker, G. W., Lee, S. Y. Hsu, C. C. & Kitamura, S. (1982) 'Reading Disabilities: The Case of Chinese, Japanese, and English'. *Child Development*, 53, 1164-1181.
- Stevenson, H. W. & Lee, S.-Y. (1990) *Contexts of Achievement*. Monographs of the Society for Research in Child Development, 55, 1-2, Chicago: Chicago University Press.

- Stigler, J. & Perry, M. (1988) 'Mathematics Learning in Japanese, Chinese, and American Classrooms'. G. B. Saxe & M. Gearhart (Eds.) *Children's Mathematics*. San Francisco: Jossey-Bass.
- Svensson, L. (1985) 'Contextual Analysis - The Development of A Research Approach'. Paper to be presented at the 2nd Conference on Qualitative Research in Psychology, Leusden, The Netherlands.
- Taylor, J. (1971) *Organising and Integrating the Infant Day*. London: Unwin Educational.
- Tesch, R. (1984) 'Phenomenological Studies: A Critical Analysis of Their Nature and Procedures'. Paper presented at the Annual Meeting of American Educational Research Association (68th, New Orleans, LA.) ED 268 122.
- Thorndike, E. L. (1913) *Educational Psychology: The Psychology of Learning, 2*. New York: Teachers College.
- Tizard, B. & Hughes, M. (1984) *Young Children Learning: Talking and Thinking at Home and School*. London: Fontana.
- The Economist (1990) 'Taiwan and the Freudian Factor'. June 2, p.67.
- Thompson, B. (1975) 'Adjustment to School'. *Educational Research*, 17, 128-136.
- Tzeng, O. J. L., Hung, D. L. & Wang, W. S.-Y. (1981) 'Speech Recoding in Reading Chinese Characters'. *Journal of Experimental Psychology*, 3, 621-630.
- Tzeng, O. J. L. & Hung, D. L. (1981) 'Linguistic Determinism: A Written Language Perspective'. O. J. L. Tzeng & H. Singer (Eds.) *Perception of Print: Reading Research in Experimental Psychology*. Hillsdale, New Jersey: Erlbaum.
- Vernon, M. D. (1957) *Backwardness in Reading*. Cambridge: Cambridge University Press.
- Vygotsky L. S. (1962) *Thought and Language*. Cambridge, Massachusetts: MIT Press.
- Vygotsky, L. S. (1978) *Mind in Society*. Cambridge, Massachusetts: Harvard University Press.
- Vygotsky, L. S. (1987) *Problems of General Psychology*. N. Minick (trans.) New York: Plenum.
- Wang, L. (1981) 'Family Structure in Rapid Modernisation'. J. C. Hsiung and others (Eds.) *Contemporary Republic China: The Taiwan Experience 1950-1980*. New York: The American Association for Chinese Studies.
- Wang, W. S.-Y. (1978) 'The Chinese Language'. *Scientific American*, 228, 51-60.
- Wang, W. S.-Y. (1981) 'Language Structure and Optimal Orthography'. O. J. L. Tzeng & H. Singer (Eds.) *Perception of Print: Reading Research in Experimental Psychology*. Hillsdale, New Jersey: Erlbaum.

- Watson, R. I. & Lindgren, H. C. (1973) *Psychology of The Child*. (3rd ed) New York: John Wiley & Sons.
- Webb, E. J., Campbell, D. T., Schwartz, R. D. & Sechrest, L. (1966) *Unobtrusive Measures*. Chicago: Rand McNally.
- Weinstein, L.(1969) School Entrance Age and Adjustment'. *Journal of School Psychology, 7*, 20-28.
- West, W. & Varlaam, A. (1990) 'Does it Matter when Children Start School?'. *Educational Research, 32*, 217-210.
- Willes, M. (1983) *Children into Pupils*. London: Routledge & Kegan Paul.
- Winch, C. (1989) 'Reading: The Process of Reading'. *Journal of Philosophy of Education, 23*, 303-315.
- Wolf, F. A. (1981) *Taking the Quantum Leap*. San Francisco: Harper & Row.
- Wood, D. (1988) *How Children Think and Learn: The Social Contexts of Cognitive Development*. Oxford: Basil Blackwell.
- Woods, P. (1981) 'Understanding through Talk'. C. Adelman (Ed.) *Uttering, Muttering Collecting, Using and Reporting Talk for Social and Educational Research* London: Grant McIntyre.
- Yardley, A. (1976) *The Organisation of the Infant School*. Oxford: Basil Blackwell.
- Young-Loveridge, J. M. (1989) 'The Relationship between Children's Home Experiences and their Mathematical Skills on Entry to School'. *Early Child Development and Care, 43*, 43-59.