CHAPTER 1

INTRODUCTION

Background

According to research in Thailand, up to 5% of school–aged students have attention-deficit/hyperactivity disorder (ADHD), representing an estimated 750,000 students throughout the country (1). In 2012, another study in ADHD (2) was conducted in Thailand. The data was collected from 7,188 cases of Thai students aged 6 – 14 years old in primary schools in 10 provinces of 4 regions in Thailand. It was found that 521 students or 8.1% of the subjects were diagnosed as having ADHD. Of this number, 12% were boys and 4.2% were girls. Interestingly, the highest rate of the disorder (9.7%) was found to be among Grade 1 students in primary school. If these students do not receive proper treatment, they will likely have academic struggles, as well as trouble in relationships with peers, teachers and even parents. These academic problems may also develop into social problems (3). It was also found that 35% of this group did not finish secondary or high school, and 52% of those who are never treated have drug or alcohol addictions in adolescence or adulthood (1).

ADHD is a neurological disorder having a persistent symptoms of inattention, hyperactive-impulsiveness and combined inattentive and hyperactive-impulsiveness (4). The disorder is variably chronic and significantly interferes with functioning or development in many aspects of the person's daily life, as well as in the person's development of the executive functions (1). There is a close relationship between ADHD and executive functions. Many studies in children with ADHD demonstrate symptoms of executive function difficulties (5,6). The concept of executive functions refers to the higher order control processes which are necessary to guide behaviors in a

constantly changing environment, such as planning, working memory, response initiation, emotion control, and monitoring of action (7,8).

Many researchers have proposed different types of behaviors related to the executive functions. For example, Brown (9) posited six groups of executive function deficits in ADHD; namely, activation (planning), memory (working memory), action (monitoring), focus, effort and emotion. Gioia, Isquith, Guy and Kenworthy (10) proposed eight clusters of executive functions that tend to be deficits in people with ADHD including inhibition, shift, emotional control, initiation, working memory, planning, organization of materials and self-monitoring. Most importantly the research found that children with ADHD and executive function deficits (ADHD+EFDs) frequently have learning disabilities (LD). They perform poorly on academic tasks, which increases the risk for grade retention and lower academic achievement (11). In the school setting, students with ADHD+EFDs exhibit academic and educational problems and struggle with student roles, self-regulation, performing complex tasks or goal-direct tasks, planning or organization, decision making, time management and problem solving (12,13). Moreover, they may also have difficulties in reading, writing or calculation (14).

From various research, students with ADHD+EFDs have three common deficits; working memory, planning and self-monitoring (10,15-20). These three executive function deficits significantly affect studying ability and the major role of school children for many reasons. First, working memory is an ability to mentally retain and manipulate information. The child with a disability in this area has difficulties remembering instructions or methods to complete complex tasks (10,21). This memory deficit impacts academic performance in mathematical problem solving and calculation (22,23). Second, planning is the ability to prepare for the future by setting targets and following a plan to achieve the goal. Planning also includes setting appropriate steps staying "on task" to reach the specific goal. A child with an absence of this ability has difficulty performing activities that include a multi-step plan. Likewise this child may be unable to achieve the activity's goal due to improper time management in each activity. Planning deficits also affects skills of speaking, writing and comprehending the main idea of the stories, which the child is reading or hearing (10,24). The last deficit is

monitoring, which is an ability to self-monitor or check their "on a task" behavior (24). An impairment in this area often manifests itself in transcription and handwriting problems in academic activities (25).

Because of all three deficits, children will encounter problems in academic performance across various subjects and skills such as mathematics, calculating, reading, spelling, writing and answering questions (26-29). Moreover, while these deficits affect a child's emotional or behavior management, they may also disturb activities of daily life by restricting roles, lowering work productivity and compromising self-expectations (12,30-32). From an occupational therapy practice framework, ADHD+EFDs engage in education, which is one of the areas of occupation. Education is defined as activities needed for being a student, participating, and learning in the educational environment. This definition includes the formal educational participation in both academic and nonacademic activities. Additionally, informal personal educational needs, and informal personal education participation, such as participating in informal classes or programs are part of the term education. A final component of this definition includes activities that provide training in a specific skill (13).

In a school setting, an effective intervention for improving academic performance is the collaboration of students and their environment in the school and at home. This collaboration includes parents, teachers, the school principal, peers and an occupational therapist (33-35). Effective collaboration in planning and evaluating the therapist and parents in an intervention process can assist children and their families in reaching meaningful and functional goals that can simultaneously promote positive academic outcomes (36).

Children with ADHD+EFDs should be the responsibility of specialists like occupational therapists (37,38). In school context, occupational therapists are professionals who determine children's capacity and help develop essential skills or functional skills for everyday life, through relevant therapeutic programs or training programs based on the frameworks, as well as models and approaches for intervention of occupational therapy (39). Occupational therapists aim to enhance or enable the children to participate in roles, habits, and routines at home, school, and other settings.

The therapists are expected to promote and enable engagement of children in their occupations that facilitate the development of performance skills through adaptations and environmental modifications in their everyday life. In educational settings, the therapist plays an important role in developing the students' performance skills, modifying the educational context and improving the individual student factors (40). Moreover, they collaborate or help establish environmental factors to support the students by informing the parents, the teachers, the school principal, and the peers about the nature of ADHD in order to promote positive attitudes among the surrounding people towards the students with ADHD+EFDs (34,40-43).

This research aimed to study problems in managing a collaborative educational inclusion framework for students with ADHD+EFDs in upper primary school, to develop a therapeutic program in executive functions for students with ADHD+EFDs, and to develop a collaborative inclusion framework for students with ADHD+EFDs in upper primary school. Collaboration in this present study was based upon the conceptual ideas of the Person Environment Occupation Performance model or PEOP model. This model highlights interrelationships among the person, environment, occupation, and participation (44). The Participatory Action Research (PAR) method was used to identify problems in the collaboration program, as well as to develop integrative intervention for students with ADHD+EFDs in school and other environments. Parents, the school principal, teachers, peers and occupational therapists worked together throughout this study. Furthermore, regarding the data collection process used in this study, the Future Search Conference (F.S.C.) technique (45), starting with identifying problems and needs for inclusive education for students with ADHD+EFDs in school was used. This technique allowed the research to explore parents', the school principal's, teachers' and peers', understanding of ADHD, as well as to collect information concerning issues. This technique allowed the researcher to develop schedules to solve the identified issues, as well as to arrange informational projects for those involved. Thus, resources used in the various aspects of this project, as well as the evaluation of their effectiveness, were based on the information gleaned from the F.S.C.

The therapeutic program that focused on improving executive functions including working memory, planning, and self-monitoring was developed and also implemented by the researcher who worked as an occupational therapist in the study. The researcher developed the therapeutic program based on both cognitive remediation approach and cognitive compensating approach specifically for students with ADHD. The expected outcomes were to understand problems in managing an educational inclusion approach for students with ADHD in the past and current situation, as well as and to create collaborative concepts of concrete action plans for students with ADHD in the future. Overall, this study was expected to present an effective collaborative inclusion framework and a therapeutic program for students with ADHD+EFDs in school and at home to enhance their academic achievement.

Purposes of the Study

This study is both qualitative and quantitative in nature with the following purposes:

1. To identify and explore problems in managing a collaborative educational inclusion approach for students with ADHD+EFDs in upper primary school.
2. To develop a therapeutic program in executive functions for students with ADHD+EFDs in upper primary school.
3. To develop a collaborative inclusion framework for students with ADHD+EFDs in upper primary school.

Research Questions

1. What were the problems and issues in managing a collaborative educational inclusion approach for students with ADHD+EFDs in upper primary school and how were these issues related to the students involved in the management for the current situation and the future?
2. How effective was this study's therapeutic program in executive functions for students with ADHD+EFDs in upper primary school?
3. How should a collaborative inclusion framework for students with ADHD+EFDs in upper primary school be successfully developed?

Definition of Terms

Attention-deficit/hyperactivity disorder (ADHD) in this study is defined as the students who have formally been diagnosed by the psychiatrist as having ADHD. The criteria for a diagnosis of ADHD are inattentive presentation, hyperactive-impulsive presentation, and/or combined inattentive & hyperactive-impulsive presentation (4) that are present in both the school setting and at home.

Executive Functions in this study is defined as the management of higher-level cognitive brain function that affects behavior and academic achievement. The term *executive functions* was divided into the following eight domains: inhibition, shift, emotional control, initiation, working memory, planning, organization of materials and monitoring (10). This study refers to three domains; working memory, planning, and monitoring.

Students with ADHD with executive function deficits (ADHD+EFDs) in this study are defined as the students who have been not only been formally diagnosed as having ADHD by the psychiatrist, but who also demonstrate executive functions deficiencies in working memory, planning, and self-monitoring. At the beginning of this study, the participants' ages ranged from 10 to 12 years old; all of the participants were studying in upper primary school in grades 4 and 6 during the 2015 academic year, in Banchaechang (Teapananukul) school, Chiang Mai.

Therapeutic program in this study is defined as the program for students with ADHD with executive function deficits. The program aimed to enhance executive functions, specifically in working memory, planning and self-monitoring in the school and at home.

Working memory in this study is defined as the ability to receive and maintain information in the mind, as well as to apply the information in activities, especially ones which include many steps or complicated procedures. This is the ability to remember methods of activities, as well as general things.

Planning in this study is defined as the ability to handle both present and future situations. It is the ability to prepare for the future by setting a target and plotting a plan to achieve the activity's goal. Planning also includes the ability to manage the time needed for each activity. *Planning* in this study also relates to the ability to organize tasks and activities.

Self-monitoring in this study is defined as the ability to monitor one's actions during and after activities, such as checking the answers during and after the school exercise or homework. This ability examines students' personal monitoring behavior.

Collaborative Programs in this study is defined as the cooperation among parents, teachers, the school principal, peers, and occupational therapists to identify problems and goals, to make decisions, to design the action plan in school and at home, as well as to work together to implement the action plan.

Future Search Conference (F.S.C.) in this study is defined as a participation method and an operative conference of representatives from different groups concerning a certain issue to make future plans (45). The method in this study employed only some steps in the conference. In this research F.S.C. included the meeting in which parents and teachers, including the school principal were divided into two groups to analyze situations in the past, and linked them to present. The groups were subsequently redistributed to exchange their opinions and information, as well as to share their experiences with managing a collaborative educational inclusion framework for students with ADHD+EFDs. Additionally, the groups worked to plan activities and to find agreeable ways to implement the various suggestions.

Benefits Gained from the Research.

1. The creation of a model to encourage and facilitate upper primary school students with ADHD+EFDs to achieve academic goals at school

2. The development of a therapeutic program targeting executive functions for students with ADHD+EFDs

3. The promotion of understanding about ADHD+ EFDs among the parents, teachers, the school principal, and peers.

4. The construction of a guideline for using appropriated activities for students with ADHD+EFDs in the school and at home.