CHAPTER 5

CONCLUSIONS, DISCUSSIONS, AND SUGGESTIONS

The objectives of this research were to develop a collaborative inclusion Framework for students with ADHD+EFDs in upper primary school, to investigate problems regarding how to manage a collaborative educational inclusion approach for students with ADHD+EFDs, as well as to develop a therapeutic program to target executive function deficits in students with ADHD+EFDs. Based upon these objects, this chapter will highlight key conclusions, offer supportive discussion, as well as will make suggestions for future research in this field of study.

Conclusions

This present study successfully developed a collaborative inclusion Framework and analyzed problems faced as such a Framework was implemented among students with ADHD+EFDs in upper primary school. Using the Participatory Action Research (PAR) method this study effectively provided a good forum for parents, the school principal, teachers, peers, and the occupational therapist (the researcher) to work together throughout the research. In addition to the PAR method, this present study also successfully integrated the Future Search Conference (FSC) technique in order to initially identify the problems related to a collaborative inclusion model in schools in the past, to articulate present issues, and to create a collaborative conceptual plan of action for students with ADHD+EFDs in the future. While the researcher played an important role as both the researcher and the occupational therapist, the collaboration among and between the researcher, the teachers, the parents, and the peers, effectively led to the development of the therapeutic program in executive functions for students with ADHD+EFDs presented in this research.

This study was carried out at Banchaechang (Teapananukul) School, Chiang Mai**,** Thailand during the 2015 academic year. The sample group was comprised of eight students in grades 4 - 6, who were diagnosed with ADHD in the 2015 academic year, eight parents, one school principal, five classroom teachers, and eight classroom peers. First, the researcher identified problems with implementing and managing a collaborative educational inclusion approach for students with ADHD+EFDs in the past, then she analyzed the current situation, as well as used the FSC method to investigate collaborative concepts for future plans generated by the focus group meetings of both the parents' group and the teachers' group. The findings of these procedures are summarized as follows:

Problems in the past

From the parents' perspective on past problems and issues in managing a collaborative educational inclusion approach for ADHD students in the past, the findings indicated three major themes: (a) the inappropriate behaviors of students with ADHD at home, (b) the lack of knowledge and understanding about ADHD and the resulting conflicts between parents and grandparents in behavior modification, and (c) the academic problems in students with ADHD. From the teachers' perspective on the same topic the results also indicated three main themes: (a) the lack of knowledge and understanding about ADHD, (b) the lack of collaboration between the home and school, and (c) the extensive workload and the high level of responsibilities of teachers in the school.

Current situation

The parents' perspective about managing a collaborative educational inclusion approach for ADHD students in the current situation also resulted in three themes: (a) parents are currently more knowledgeable about ADHD than in the past, (b) parents and teachers work together more than they used to in the past to help their children and students succeed, and (c) ongoing academic problems for students with ADHD persist. From the teachers' perspective on the same topic, there were also three key themes: (a) currently teachers have more knowledge about ADHD than in the past, (b) ongoing academic problems in students with ADHD persist, and (c) presently schools are supported by government funds much more than they were in the past.

Collaborative concepts in the future from both parents and teachers

Analyzing teachers' and parents' perspectives concerning the future about creating collaborative concepts to manage a collaborative educational inclusion model for students with ADHD also yielded four themes: (a) It is necessary to give information to people relating to the students with ADHD at school and at home; (b) It is important for teachers, parents and the occupational therapist to work as a team to best support the ADHD+EFDs; (c) Employing a "Buddy System" is useful, and (d) Using computer software programs can further support these students.

Through applying the FSC method, the researcher gathered information from these focus group discussion and subsequently used this data to develop various projects for parents, teachers (including the school principal), peers, and students with ADHD+EFDs. The resources and information used in the project development were fully based on conclusion drawn from the FSC meetings. Results of the FSC were obtained from all of the participants, who reflected their perspectives concerning the action plans which they thought the most the important, the most suitable, and the most possible in the near future. The top four collaborative strategies that these focus groups determined to be most crucial are as follows: (1) use computer software programs at school, (2) employ a buddy system at school, (3) provide information to people relating to the students at school and home, and (4) promote collaboration among the teachers, the parents, and the therapist. The researcher analyzed all the information from the participants, giving careful consideration to the activities, which could support the ADHD+EFDs students' participation in their occupation. The specific projects developed by the researcher for use in this study consisted of the following:

(1) The projects for parents, teachers (including the school principal), and peers:

- The project for parents included a strategic training and home program for parents.

- The project for teachers and the school principal consisted of a strategic training and a classroom management program for teachers, which was uniquely designed to address the unique needs and challenges of classroom management in mainstreamed classrooms.

- The project for peers included a peer training program, the Buddy Program, and a classroom peer-training program.

(2) Therapeutic programs in executive functions for students with ADHD+EFDs.

The study employed data from the focus group discussions based upon the FSC method, as well as used both a computer software and paper and pencil format to implement target therapeutic programs in executive functions, which focused specifically on the working memory, planning, and self-monitoring. In the computer software format there were three activities; visuo-spatial working memory, a letter-spanning task, and a backwards digit-span challenge. All of these activities had visual and auditory stimuli to enhance the working memory. For the paper and pencil format, the following were included: word lists to improve working memory, maze games to improve planning, and self-monitoring checklist to improve the monitoring component of executive functions. The researcher implemented the therapeutic programs in executive function for students with ADHD+EFDs during 21, one-hour sessions within seven weeks; thus, the group attended the program three times a week.

Finally, the researcher evaluated the efficiency of the program for boosting executive function specifically in the areas of working memory, planning, and self-monitoring. Then, the researcher evaluated both the behavior and the abilities in each executive function component of students with ADHD+EFDs. Lastly, the researcher assessed the effectiveness of this collaborative inclusion study pattern for primary school students with ADHD+EFDs using level changes based upon the students' GPA in the first semester during the 2015 academic year. The effectiveness of this Framework was also measured by the parents' and teachers' satisfaction with the Framework. The results of the last phase in this study are summarized next.

Within-group analysis revealed that the changes on the BRIEF (Parent) exhibited statistically significant improvements after the intervention in the median scores of the Behavior Regulation Index and Global Executive Composite with the large effect sizes (p<.05); however, no statistically significant differences were found in Working Memory, Planning, and Monitoring scale. The BRIEF (Teacher) revealed statistically significant improvements after the intervention in the median scores of Working Memory, Planning, Monitoring, Behavior Regulation Index, the Metacognitive Index,

and Global Executive Thus, on the composite scale which yielded a large effect sizes, the scores improved (decreased) after intervention in all students with ADHD+EFDs (p<.05).

The TOL^{DX} standard scores revealed statistically significant improvements after intervention in the median scores with a large effect size (p<.05) of the following variables: "Total initial time" and "Total execution time." and "Total time." However, no significant differences were found in the variables "Total moves," "Total correct," "Rule violation," and "Time violation."

The WISC-R (Digit Span subtest) scores exhibited statistically significant improvements after intervention with a large effect sizes (p<.05).

The GPA of students with ADHD+EFDs before and after the use of the therapeutic program showed significant improvement. The median scores of the GPA of students with ADHD+EFDs increased and comparison of these pre- and post-treatment GPA scores yielded a large effect sizes at p <.05.

The result of the parents' and the teachers' satisfaction in the therapeutic program for students with ADHD+EFDs after intervention shown that the parents were extremely satisfied in all aspects which included the procedure, the service provider, the facility, and the quality of the program. Similarly, the teachers and the school principal were "extremely satisfied" in two aspects (the service provider and the facility) and were "very satisfied" in the procedures and quality of the program.

Over all, the findings from this study yielded in an innovative Framework deemed the "CEFP Framework." Each of the key letters of acronym that comprises the Framework's name will be explained below.

First, the letter C in this Framework's name stands for the word *collaboration* and refers to the alliance between and among the stakeholders, which includes the occupational therapist (the researcher), the teachers, the school principal, the parents, and the student peers of the ADHD+EFDs students. This collaboration process started with identifying the past problems in creating and implementing a school-based collaborative inclusion model. After these past issues were identified, the researcher

turned the participants' focus towards discussing the present concerns in creating and managing such a program. Next, the participants and the researcher worked together using the Future Search Conference (FSC) technique to brainstorm future-oriented, collaborative action plans for students with ADHD+EFDs. This action plan included "EFs" or executive functions, which in this study refers to the therapeutic programs in executive functions for students with ADHD+EFDs, which were developed by the researcher. The programs also included a computer software format and paper and pencil format in working memory, planning, and self-monitoring. The therapeutic programs in executive functions consisted of: working memory activities and visuo-spatial working memory tasks, a backwards digit-span, letter-span task, a word list recall. For the executive function, "planning," a maze game was used. Finally for the monitoring activity, the researcher used a self-monitoring checklist.

The next letter in the acronym is the letter P, which is defined by the word *projects.* These projects were developed by the researcher, based upon the information produced via the FSC method. The projects in this Framework consisted of the projects for parents (the strategic training project and the home program project for parents), the project for teachers and the school principal (the strategic training and the classroom management program for teachers), and the project for peers (the peers training program; the "Buddy Program" and the classroom peer training project).

This Framework was developed by integrating relevant principles, theories, and frameworks found in the literature across three separate fields: occupational therapy, psychology, and special education. Further support for this Framework's development came from the information gathered from the findings from the FSC method. While this Framework is most suitable for inclusive schools in which students with ADHD+EFDs study in the same classes as regular education students in grades 4–6, the CEFP Framework developed by this research can also be applied to schools with similar contexts.

Discussion

Next, the researcher will discuss each of the results according to the research objectives.

1. To identify problems in managing a collaborative educational inclusion approach for students with ADHD+EFDs

The first objective of this study was to use the FSC technique to allow parents and teachers (including the school principle) to identify problems and issues in managing a collaborative educational inclusion approach for students with ADHD+EFDs. In this study, all of the participants analyzed situations in the past and then linked them to the present. As a result, they were able to synthesize the information in order to create a collaborative overview of necessary action plans for the future.

As mentioned above, one of the core problems that the teachers and parents identified for the past was the overall lack of knowledge and understanding about ADHD. This finding is consistent with the results from previous studies, which reported that teachers had little or limited knowledge about ADHD, and that they were not experienced with the use of psychostimulant medication (147). These findings were also consistent with other studies' results regarding both the parents' and the teachers' attitudes. These previous studies similarly found that there was a significant positive correlation between knowledge about ADHD and attitudes towards ADHD (148). In addition, this study found that the parents often experienced the impact of their lack of knowledge and its influence on grandparents' attitudes. Thai family structure embraces the importance of living with extended family members. Thus, several generations ranging from great-grandparents to great-grandchildren, may all share the same house. As such, if all members of this family system do not have adequate knowledge about ADHD, the child may not receive consistent, appropriate support at home. Based upon this cultural norm, for the Thai context, information about ADHD should be provided to not only the child's parents, but also to the grandparents and other adults who closely relate to the ADHD child. This is vital because children in Thai society must not only obey their parents, but they must also obey their grandparents and other adults in the family system. If the grandparents are not well educated about and equipped with

ADHD information, they may insist on the wrong treatment for the ADHD child. To further complicate this issue, given that the grandparents are the leaders in the family, the parents of the ADHD child will be limited in their ability to object to their own parents, as social norms compel them to comply with their elders. Thus, while the potential for family conflict in behavior modification approaches persist, as this study's findings show, equipping people with adequate information is an important step in helping to address this problem.

Moreover, this parenting issue is not confined to a Thai context. For example, in a study about people's knowledge and attitudes towards ADHD among 196 elementary school teachers in Shiraz, Iran, the researchers found that 53.10% of all the teachers considered ADHD as the result of parental spoiling. Thus, the minority of teachers (46.90%) reported that ADHD was caused from biological and genetic vulnerabilities. The results of this Thai-based study also identified a significant correlation between teachers' knowledge of ADHD and their attitude. In fact, the teachers' attitude score towards students with ADHD was quite low (149). The other themes from the parents' perspective at home were unwanted behaviors and academic problems of students with ADHD. The problems identified in this study are consistent with the DSM-5's (4) descriptions that signifies the characteristic of ADHD. Some of these characteristics include difficulty sustaining attention, forgetting daily activities, difficulty with organization, excessive talking, and difficulty waiting. Several symptoms of ADHD are present in more than one setting such as home and school (4). Moreover, the findings of this study were consistent with other research findings such as the results of previous studies about the problems of ADHD at home and in the school. Similar to other studies, this present study found that students with ADHD perform poorly in academic tasks, which increases the risk for grade retention, lower academic achievement, difficulty in self-regulation, challenges in completing complex tasks performing or goal-direct tasks, trouble planning, difficulty in making decisions, time management, and problem solving (11-13).

At school, the teachers stated many responsibilities at work prevented them from collaborating and building a more extensive relationship between home and school. The findings of this present study on this problems in the past were consistent with problems of the teachers in small schools in Thailand found in previous studies. These studies

indicate that, the teachers have an extraordinary amount of work and a difficult teaching load across several classes in the school (150). Encouraging or supporting the students with special needs in school requires teachers to take the necessary time to plan and evaluate special programs, such as supporting these students' through developing an individual education plan (IEP). Teachers should also take time to collaborate with parents or the educational team members. However, if teachers are overworked and have limited time, then the frequency of communication and collaboration among this team will necessarily be limited.

In the current situation, the research findings showed that the parents and the teachers have more knowledge about ADHD and work together more frequently to help these children now than they did in the past.. These findings are consistent with the information presented in the Education for Disabilities Act B.E. 2551 (151), the national law to protect children with disabilities in Thailand. This law mentions services, assistive technology, and other resources suitable to support students with disabilities so that they can successfully participate in an inclusive education in a regular school setting. Moreover, this law states that the government must provide funding for inclusive schools, and schools which have children with special needs. Through this law, the Thai government encouraged teachers to be more knowledgeable and to provide more extensive support to the students with special needs in school. In addition, both the parents and the teachers can access via the internet and television more information about ADHD and activities to help support these children. This finding that parents and teachers have more knowledge about ADHD now than in the past is also consistent with the previous research among other elementary school teachers (149), which found that television, radio, friends, relatives, periodical, magazines, and newspapers were the main sources of knowledge about ADHD.

Furthermore, in the current situation, both the teachers and the parents agreed that academic problems were common among children with ADHD. As the findings from this present study showed, this problem was related to the previous lack of knowledge about ADHD, conflicts between parents and grandparents, and lack of collaboration between home and school. These findings regarding academic problems of students with ADHD further relate to the clinical definition of ADHD from the DSM-5 which

reports that students with ADHD present persistent symptoms in two or more setting including home and school (4). Moreover, this finding is consistent with the previous studies about ADHD, which found that students with ADHD demonstrated significantly lower scores on academic achievement tests in reading, spelling, and math. This earlier study also found that these students received lower grades, had poor educational outcomes, and dropped out of high school before graduation (49,50).

The findings related to the collaborative concepts for the near future highlighted the value of using computer games or computer-based training programs to improve the academic performance of ADHD children in the fields of attention and memory. This conclusion relates to information gained from the teachers, who said that in their classes, ADHD students often had trouble remembering things and had a short attention span. These findings further relate to a previous study that used a computerized training program to train the working memory in children with ADHD. According to one study, the ADHD students' performance on the working memory tasks significantly improved after training (19). Computer games are an attractive media to enhance motivation and help the children stay still, focus, or sustain attention by providing visual and auditory stimuli and immediate feedback in terms of response accuracy (96,97).

The research findings from the FSC highlighted that the participants believed in the need for quality friendships with peers, as well as the need to encourage positive functioning performance of the children with ADHD. Instructional characteristics of a good peer or buddy can enhance the attention span of the ADHD students, as well as can encourage increased on-task behavior in the classroom (152). These students reflect the concept of "a good buddy," one student who studies together with the ADHD student in academic tasks in order to provide assistance and appropriate feedback to the ADHD student. On the other hand, ADHD students have difficulties in their relationship with peers, and social difficulties are an extremely common problem in ADHD students (153). As a result, ADHD students need to have a buddy who understands ADHD symptoms and who has a positive attitude towards helping his or her ADHD friend at school. In a classroom setting, the important role of the buddy also includes facilitating a positive response when studying in the class, enabling the ADHD student to complete class assignments and to pay more attention to academic work (52).

In this study, most participants indicated that they needed to receive more information about ADHD, which is consistent with another study that found that teachers' knowledge about ADHD might impact their classroom practices and teaching pedagogy; both of which severely influence ADHD students' academic performance (154). In addition, the teachers expressed their desire to have key questions answered. Questions such as "Why do ADHD students, who have normal IQ, have academic difficulty?" and "How can the classroom teachers help to solve the ADHD student's academic and behavioral problems?" were repeatedly raised by the participants in this study. Giving knowledge to people who are close to the students in educational environments is absolutely necessary for the success of any collaborative model. This information sharing should include teacher consultations regarding classroom-based accommodations for ADHD students in the educational environment of the school. Similar findings were produced in West, Taylor, Houghton, and Hudyma's study (153), which reported that the teacher's knowledge and beliefs about ADHD influenced ADHD students' academic performance in the classroom. At home, an effective training program for parents such as using appropriate strategies, like rewards and positive reinforcement, to establish effective routines after school, could help enhance the ADHD student's performance, while simultaneously, could reduce symptoms and impairments associated with ADHD (101). However, as this study found, the training program for the teachers and the parents must begin by providing them with necessary information and knowledge about ADHD. This leads to accurate perceptions, which can also make it easier for the children to receive appropriate treatment.

The participants in this study suggested that the most important key to supporting ADHD students' academic achievement was collaboration, which was identified as teachers, parents, and the therapist working together. Since ADHD students spend daily life both at home and at school, the collaborative practices with people who are directly in contact with the child are very important. This is consistent with The Person Environment Occupation Performance Model, which indicates that the transactional relationships among four components; person, environment, occupation, and performance, necessarily impact occupational performance and participation in daily life (44). As applied to this present study, both the parents and teachers are part of the environment component of this model, and it is believed that these environments

influence human behavior (44,114). Previous research found that effective collaboration among teachers, parents, and an occupational therapist can help enhance the ADHD student's academic achievement and school performance (120). In the school setting, the occupational therapists plays an important role in analyzing, selecting, and developing the tools for evaluation, intervention and outcome processes (102). They also must maintain a positive attitudes and need to collaborate with parents and teachers, which is critical for the success of the intervention process for children (34). In this study, the occupational therapist played the significant role as a facilitator managing the cases, which started with creating an optimistic attitudes in parents and teachers, and continued in organizing and managing the program through using the FSC technique in team meetings. The therapist encouraged the team members to identify the problems that ADHD students face in the past, the present, in order to establish a therapeutic program for the future.

2. Develop and examine the effectiveness of a therapeutic program in executive functions for students with ADHD+EFDs.

This study also examined the effectiveness of a therapeutic program in executive functions for students with ADHD+EFDs. The aim was to examine whether students would improve during the therapeutic programs specifically in the areas of working memory, planning, and monitoring, based upon acquiring support from their parents, teachers and peers at both school and home.

Programs of this study were divided into two types which were directly targeting students with ADHD+EFDs; (1) the therapeutic program in executive functions and the indirect program for students with ADHD+EFDs; and (2) the collaborative program with their parents, teachers, school principal, and peers.

(1) The direct program for students with ADHD+EFDs. The therapeutic program in executive function included a computer software format and a paper and pencil format, which was developed for improving executive function skill in working memory, planning, and self-monitoring. The researcher developed the program based upon a developmental frame of reference and plenty of research relating to working memory intervention for students with ADHD. Moreover, since the program took

suggestions from five experts who had worked in related fields for at least five years determining the study instruments, the program illustrated good content validity. For this study, a therapeutic program in executive functions for students with ADHD+EFDs was administered to the student each day (21 times), each task took 10 to 20 minutes to complete, which means that the students repeated all tasks in each day. Repeated practice of therapeutic program in executive function activities is an important key to improve executive functions, since the improvement of executive functions deficits depends heavily on the amount of time practiced (19,56).

Working memory, the therapeutic activities were a visuo-spatial working memory task, a backwards digit-span, a letter-span task (computer software format) and a word list recall (paper and pencil format). The study found significant improvements with large effects sizes on BRIEF (Teacher), and also in WISC-R (Digit Span subtest) scores. In the working memory training, the researcher taught a technique to enhance stored and manipulated the information of four tasks, such as verbal self-instruction, rehearsal or grouping techniques in digit span tasks. The third type of activity featured a computerized training program which was an attractive media that could enhance motivation and attention, as well as could help the children stay still and focused by using visual and auditory stimuli and immediate response accuracy feedback (85,86).

In this computerized training program, the students advanced in levels of difficulty; however, if they did three incorrect trials, they had to repeat the process starting from level one of tasks on the next day. Repeated practice is vital for improving executive functions, especially in the area of the working memory, which can be improved by training (56,155). The results of this research were consistent with finding of previous studies that illustrated the significant improvement of children's working memory after intervention through computerized training program. Shiels and a colleague in 2008, also used a computerized spatial span task with 21 children (aged 7-10) with a diagnosis of ADHD. The results illustrated that the participants' performance significantly improved after intervention (99). In the past, many researchers used visuo-spatial working memory tasks and backwards digit-span tasks for training working memory (16,19,156). Moreover, the improvement of the working memory after intervention was consistent with previous evidence regarding the increase

of the neural mechanisms that were recorded during computational training programs. Evidence showed that these neural mechanisms could promote increases the activity of the prefrontal neurons and could enhance the connectivity in the prefrontal cortex, as well as between the prefrontal and parietal cortex (155). These brain regions have been found to be associated and closely related with working memory (58). Olesen, Westerberg, and Klingberg's study in 2004 presented strong evidence of the changes in the brain activity via working memory training. They investigated the changes in brain activity by working memory training for 5 weeks (three visuo-spatial working memory tasks) using a computer software format. They measured the brain activity with functional magnetic resonance imaging (fMRI); the results illustrated that working memory training increased the neural systems in the prefrontal, parietal, and parietal cortex, especially in the middle frontal gyrus and superior and inferior parietal cortices (157). As such, the findings of this present study are consistent in numerous ways with previous studies in this area.

Planning. For the planning aspect of this study's intervention program, the therapeutic activities were maze games using a paper and pencil format. The researcher used maze games to enhance the planning ability of the students with ADHD+EFDs in this study. In this activity, there were seven levels, each of which contained five items, so the total number of items was 35. The students advanced in levels of difficulty indicating that they became more skilled in the achievement of the tasks. After completing all seven levels, they had to repeat mazes from levels five to seven of the tasks again on the next day of the 21 times of implementation. Repeated practice is an important key to improving executive functions as executive functions can improved based upon the number of times students practice (19,56). Maze games are traditional games and are well known to children in Thailand. The goal of using these mazes was to enhance the child's ability to plan and draw a line from the starting point to the end. This study found significant improvements with large effect sizes on the BRIEF (Teacher), and also on the standard scores concerning total initial time, total execution time, and total time after intervention of the TOL^{DX}. These results suggested that the children initiated the tasks by using thoughtful preparation and planning using their time wisely to solve problems or complete tasks in less time (145). The results in the planning aspect of this study were in line with previous studies that used labyrinths

tasks in a paper and pencil format. Labyrinth tasks are based on the same principles as maze games to enhance planning performance in children with ADHD+EFDs (91). It has been shown that this activity promotes students' ability to plan through practicing anticipation and navigation in the mazes to reach the goals in the game (101). Moreover, the results in students' planning ability after the intervention were consistent with the previous study by Montani, De Filippo DeGrazia, and Zorzi (157) in 2014. The researchers used videogames that presented labyrinth or maze games to train students' attention and executive functions. The games had eight levels of difficulty, and the participants were asked to play the game for 40 minutes every day for 14 days. The design of the task achievement required planning ability, attentional control, and the other executive functions. The researchers reported that the game could be effectively used to stimulate students' planning ability and to improve executive functions, such as attentional control and enhanced mental flexibility.

Monitoring. For the monitoring aspect of this study's intervention program the therapeutic activities included a self-monitoring checklist using a paper and pencil format. The researcher used a self-monitoring checklist to promote the children's ability to examine their own actions or behaviors during and after a certain activity. The students with ADHD+EFDs would evaluate their actions to see if they were suitable and relevant to the target task in the school or at home. Monitoring in this present study, was measured by the monitor subscale of the BRIEF instrument. There were statistically significant improvements with large effect sizes on the BRIEF (Teacher) assessment. These results were consistent with Mirnasab and Bonab's (111) in 2011 study, which investigated the effect of self-monitoring techniques in students with ADHD. These researches asked the students to use a self-monitoring card and self-monitoring cue tape to assess their own behavior in the classroom setting. The results indicated that the intervention program could improve the students' self-control and also reduced inattentive behaviors in the classroom. In addition, the researchers used self-monitoring along with rewards and other reinforcements to help motivate the students to monitor themselves daily. Mirnasab and Bonab's study results in 2011 were in line with the results from an even earlier study in 1995 by Edward, Salant, Howard, Brougher, and McLaughlin (158) that found that self-monitoring paired with reinforcements could be

used to improve reading comprehension performance and on-task behavior in students with ADHD.

Based upon the evidence in these earlier studies, in this present study, the researcher not only implemented the checklist with the students with ADHD+EFDs, but also collaborated with the parents and the teachers to reinforce the students' efforts at school and at home. Thus, the self-monitoring behavior was enhanced as the students not only monitored themselves every day, but parents and teachers also helped to provide the students with reinforcement regarding self-monitoring at school and home. Repetition and practice are crucial for improving executive functions (56); as such, this process promoted the students' transfer of learning of self-monitoring skills across different settings. The use of collaboration with the parents and the teachers to improve the self-monitoring performance of the students with ADHD+EFDs in this research was consistent with a previous study by Davies and Witte in 2000, which investigated a multicomponent-intervention approach. Davies and Witte's intervention approach included self-monitoring, peer feedback, group support, and teacher checking of the students' self-monitoring. Davies and Witte reported that the students with ADHD showed improvement in the area of uncontrolled verbalizations (158).

A collaborative program with parents, teachers, school principal, and peers was another intervention components of this present study. This component will be discussed next.

(2) Indirect program for students with ADHD+EFDs: the collaborative program with parents, teachers, school principal, and peers.

The parents. In this present study, the researcher collaborated and developed a project for parents that was entitled "Strategic Training and a Home Program." This program are consistent with Pfiffner, Mikami, Huang-Pollock, Easterlin, Zalecki, and McBurnett's study in 2007 (112), which used a home-school behavioral treatment program for children with ADHD. They trained the parents of the children with ADHD in effective means for using home management and plans, including homework management training. Another study by Hahn-Markowitz, Manor, and Maeir (38), evaluated the efficacy of the Cog-Fun program in children with ADHD.

They used goal-oriented behavioral training to address planning problems in children, as well as worked with the students' parents; after the training, the parents observed their child's development in the homework management training in the home context. The results show significantly improved behavior and a reduction of symptoms associated with ADHD.

For this present study, the researcher taught the stakeholders about the symptoms of ADHD, executive function deficits, and suitable strategies to address these needs. After giving this basic knowledge, the parents were trained and prepared in a home program to support the students with ADHD+EFDs at home. The program included a monitoring program, homework management, training in how to prepare classroom materials for the next day, and ways to encourage positive behaviors in their child after school. In the home environment or in the after-school program, parents played the important roles of monitoring, assisting during the homework time, preparing the classroom materials for next day, and encouraging positive behaviors in their child (119). This approach was consistent with the results of previous research, which indicated that when both the parents and the students worked together to monitor the homework time, homework behavioral problems diminished (159). In addition, these findings closely related to the previous findings by Dettmer, Thurston, and Dyck, in 2002. Dettmer et al. emphasized the importance of parental participation in the collaborative program. Parents' roles included encouraging and supporting their child to be successful in school, through providing appropriate strategies in the home environment, using appropriate communication skills, and encouraging activities that helped to improve the child's behavior (160).

The teachers and the school principal. The researcher collaborated and developed the project for teachers that was entitled "A Strategic Training and Classroom Management Program for Teachers." This program related to the previous evidence reporting the effectiveness of collaboration between teachers, school principals, and occupational therapists. This collaboration included giving information, identifying goals, planning ways to facilitate student success in educational settings, and supporting students' academic goals (120). In the study, the researcher provided foundational information to the teachers and the school principal about the symptoms of

ADHD, executive function deficits, as well as suitable strategies to address these deficits. Moreover, the researcher trained and prepared the teachers for the classroom management program to support the students with ADHD+EFDs in the classroom. These programs included strategies to support the students in the classroom by using an assignment book to track homework, by teaching students to take notes during the class (113), and by using a monitoring program. For the strategy training programs, in the school environment, the teachers played key roles in organizing and monitoring the behaviors in students with ADHD. They took action in classroom modifications and applied appropriate strategies that were suitable for the student with ADHD with EFDs; these efforts helped to contribute to positive behavior in the students in the classroom. Barg, Carlson and Mosercan (161), in 2013, used similar strategies (such as using seating arrangements and auditory stimuli) as this present study and reported that these classroom modifications could be beneficial to the students, as well as could be utilized to facilitate learning.

The peers. The researcher collaborated and developed a project for student peers that was divided into two programs: "The Buddy Program" and "Classroom Peer Training Program." The researcher decided to develop this peer project because peers are an important factor in the classroom and the school environment. Peers play a crucial role in facilitating a positive response to the students with ADHD by providing guidance and immediate feedback in the class, enhancing students with ADHD ability to complete class assignments, and modeling how to pay attention to tasks in the classroom (52,108). In this present study, the project for peers focused on fostering a good attitude among the peers. The researcher provided information to the buddy and all the classroom peers about the symptoms of ADHD and how to help the students with ADHD+EFDs at school. In addition, for the "Buddy Program," the researcher trained the classroom peers about the buddy's roles in supporting the students with ADHD, which included facilitating a positive response at school, providing guidance and immediate feedback in class, encouraging their ADHD friend to complete his or her class assignments, and paying attention in the classroom (35,52,108). These aspects of the "Buddy Program" training related to previously documented data about peer influences. Specifically, it was reported that peers are an important factor in a school environment because positive relationships with peers in classroom can decrease the

children's risk of future problems such as negative social interactions and academic difficulties (139).

In this present study, the researcher developed and implemented all programs for students with ADHD+EFDs based on a cognitive approach, which integrates both a remediation approach or a "bottom-up" approach and a compensating approach or a "top-down" approach to improve executive functions. The remediation approach is a task-specific training measure to improve certain problems. The principle of this technique is to provide an opportunity for the child to learn and practice frequently through activities specifically designed to address questions or to provide task-specific training. This approach helps to stimulate changes in neuronal activity (88), which focuses on direct training or treatment in the components of cognitive or executive functions (89,90). While the cognitive remediation approach in this present study refers to the direct program for students with ADHD+EFDs, the cognitive compensating approach refers to environmental adaptation and strategy training. For this present study, the cognitive compensation approach focused on the person in the whole context, and the relevance between the student and occupational dysfunction rather than medical conditions. Furthermore, it concentrated on environmental adaptation, compensation, prevention, accommodation, skill acquisition, and strategy training (88,103).

These approaches effect student post-intervention improvement because the students with ADHD+EFDs had to repeat the task specific training in the laboratory context, as well as to apply practice this training everyday using executive function in real-life settings. After the students with ADHD+EFDs completed all the intervention programs, the study found a strong positive change in the students' GPA (Table 4.4) that reflected improvement in their academic performance. The findings of this study were consistent with Person Environment Occupation Performance Model, which indicates that the transactional relationships among four components: person, environment, occupation, and performance, affects occupational performance and participation in people's life (44). Parents, teachers, school principal, and peers were included in the environment components of this model. It is believed that these environments influence human behavior (44,114), as previous research found that the effectiveness of collaboration among teachers, parents, and an occupational therapist

could enhance ADHD+EFDs students' academic achievement and school performance (120).

Over all, these results support the efficacy of the intervention program for students with ADHD+EFDs. The findings indicated that most outcomes were improved after intervention. Granted, there were no statistically significant differences in the within group improvement on BRIEF (Parent) rating scales after intervention. However, one of the key problems that confronted the parents group was the conflict between parents and grandparents in behavior modification approaches for the ADHD+EFD child. As alluded to above, the traditional nature of Thai families consist of many generations, so if, all adult members of the family do not have adequate knowledge about ADHD, the child tends to have inconsistent support at home. However, for this present study the Behavior Regulation Index or BRI and Global Executive Composite or GEC scores were statistically significant with large effect sizes after intervention. The BRI is comprised of three indexes of executive functions (inhibiting, shifting, and emotional control), while the GEC is a summary score of all eight index of executive functions of the BRIEF. These findings indicated that the children improved their ability to appropriately regulate their behaviors. Moreover, the results of the GEC could be a reflection of the students' executive function improvement (10). In addition, from data analysis, the other index of executive functions were improved after intervention which suggests that the intervention programs could have also promoted other components of executive function such as enhancing inhibition, shifting, emotional control, initiation, and enhancing generalization to untrained skills component of executive function. These results are consistent with previous evidence that was presented in Figure 1 (56), which show the relationship among the three components of executive functions: inhibition, working memory, and cognitive flexibility. The inhibition and working memory are closely related, and both influence cognitive flexibility. Inhibition, working memory, and cognitive flexibility are also related with higher-level executive functions (reasoning, problem solving, and planning) (56).

3. Develop a collaborative inclusion Framework for students with ADHD+EFDs in upper primary school.

The outcome measurement after using a collaborative inclusion Framework for students with ADHD+EFDs in upper primary school or "CEFP Framework" was assessed by the students' GPA (Table 4.4.), as well as by the parents' and teachers' satisfaction after participating in the study. The research found a strong positive change in the students' GPA, which reflects improvement in their academic performance. The result of the parents' and the teachers' satisfaction in therapeutic program for students with ADHD+EFDs after the intervention showed that the parents were extremely satisfied in every aspect of the program (e.g. the procedure, the service provider, the facility, and the quality of the program). The teachers were "extremely satisfied" in two aspects; namely, the service provider and the facility, while were "very satisfied" with the procedure and the quality of the program. In addition, the teachers reported that students with ADHD+EFDs who participated in this research improved their school performance and behaviors. Two parents reported that their child also showed improved behaviors at home. For example, they were better able to concentrate on their homeworks and did not forget to hand in their homeworks at school. Moreover, three teachers said that every program in this research was very useful, and they suggested continue using the CEFP Framework in the next semester.

CEFP Framework was developed by using principles and theories of occupational therapy, applying psychological principles, and by including educational strategies. Those involve the PEOP Model (44) sought to improve the quality of the transactional relationships among and between the teachers, the school principal, the parents, the peers, the occupational therapist so that the performance of students with ADHD+EFDs could improve. Moreover, the principles of this framework were consistent with a previous study that reported an important thing to improving academic and educational outcome of students with ADHD were enhancing collaborations among family, school professionals, and health care professionals (14). The key person in this framework is an occupational therapist. The therapist evaluates the children to see if they are successfully participating in their occupations and also encourages them in positive behaviors in educational setting and their home (42). Moreover, the therapist

also, essentially, encourages the student's performance skills, performance patterns, educational context, activity match, and individual student factors (40). The occupational therapist focuses and plays an important role as the facilitator to support children with ADHD+EFDs to participate in their daily life situation (117,128). In a school setting, the occupational therapist also informs or constructs good attitudes and promotes collaboration with the parents, teachers, a school principal, and peers. This coordination is absolutely critical for the success of the intervention process for children with ADHD+EFDs (34). In this study, the researcher worked as an occupational therapist to develop all programs and worked in all process stages including the preparation stage, the operation stage, and the evaluation stage in order to support the ADHD+EFDs students' ability to improve their behaviors and to adjust their level of academic performance.

Limitations of the study

The first key limitation of this study was the limited sample size. As indicated above, the sample size included only eight students. As such, the sample size was quite small. Another limitation was that the participants came from only one school. In order to have a better representative sample, students from numerous schools should have been included. If the participants were recruited from a wide variety of schools, then perhaps, the study may have yielded different results. While the researcher chose to recruit this study's participants from a single school in order to expedite the research process and stay within a limited timeline, as it stands, generalizations of this study's findings are limited. A final limitation of this present study was the fact that the researcher also played the role of occupational therapist in this study. In order to allow the researcher to complete all the study's objectives, it may have been better to have secured an independent occupational therapist to implement the therapeutic program designed for this study. However, in spite of these limitations, this present study provided an initial understanding of the process of developing a collaborative inclusion Framework in the Thai context. Next, suggestion for further research will be discussed.

Suggestions for further research

Suggestions for further studies include the following:

1. In order to more fully understand details and challenges in developing and applying a collaborative inclusion model for students with ADHD+EFDs in upper primary school, further research in different contexts should be conducted. Using this present study's finding, other researchers should replicate this study in other schools with similar contexts across various locations in Thailand. For example, further studies could investigate whether developing and applying a collaborative inclusion Framework for students with ADHD+EFDs would differ based upon a rural setting versus an urban one or a northern setting versus a southern one.

2. Future research should also include a much larger sample size with a different research design. For example, subsequent studies should include a control group, which would allow for further comparisons and conclusions across the experimental and the control group's results. Another recommendation for subsequent studies is for grandparents and/or other extended family members who are part of the ADHD child's family system to also participate in the group forums. It would be quite beneficial to investigate if including these other stakeholder would provide any further support for the ADHD+EFD child.

3. Future studies should also include follow-up assessments about the effectiveness of the therapeutic program in executive functions at the 3-month, 6-month, and the 12-month point. Longitudinal studies could also provide more extensive information about this subject.

4. Future studies should also investigate how effectively and by what process students transferred the skills acquired through the therapeutic intervention to their learning process and their school performance.

5. A final key recommendation for a future study is to design and apply computer software protocols that focus on executive function skills in the working memory. This type of software should target not only upper primary students, but also

secondary students, and perhaps, distinct sub-groups of students (i.e. computer software programs for girls, boys, athletes, musicians, artists, etc.).