CHAPTER 3

METHODOLOGY

This present research utilizes Participatory Action Research (PAR) design. The PAR design enables students with disabilities to play a role in analyzing problems so that they can systematically identify the origins of these issues, as well as find practical ways to solve them (143). Using this design, the occupational therapist analyzed and developed the process and provided opportunities for students with ADHD+EFDs to practice the necessary skills. Enhancing collaboration with the teachers, the school principal, the parents, and the peer students through Future Search Conference technique (F.S.C.) was another major tool used in this present study. Developing a collaborative inclusion program for students with ADHD+EFDs starts with identifying problems and goal, promoting positive attitudes, and designing evaluation and intervention programs (122, 123). Both qualitative and quantitative methods were used to collect data for this present study.

The Research Design: The process of implementing a research design in this study included three distinct stages. As such, the steps taken by the research in each of these three stages of research design are listed below.

1. Preparation Stage:

- Selected population and the sample groups.
- Explored executive function problems.
- Explored general perceptions about ADHD and collected lists of problems from parents, school principal, teachers and peers.
- Developed and trial tested the data collection tools and therapeutic programs.
- Collected data from focus group discussions based on the F.S.C. method.

2. Operation Stage:

- Implemented the therapeutic program for students with ADHD+EFDs.
- Arranged informational materials and projects for parents, teachers, school principal and peers.

3. Evaluation Stage:

- Evaluated the efficiency of the therapeutic program in students with ADHD+EFDs.
- Evaluated the collaborative inclusion model from the students' GPA, the parents' and teachers' reported satisfaction level.
- Analyzed all data statistically.

The Research Process: The research process utilized in this study was also divided into three distinct stages; namely, the preparation stage of the research process, the operation stage, and the evaluation stage of the research process. Each of these subcomponents of the research process is highlighted below.

1. **Preparation Stage**

It is important to understand who comprised the collaborative team in this present study's collaborative program. The team members included the occupational therapist, the parents, the teachers, the school principal, and student peers. Based upon these needs to implement this collaborative program several preparatory steps were taken. These steps take by the researcher are listed below:

1.1. Obtained institutional review board approval from the ethics committee, Faculty of Associated Medical Sciences, Chiang Mai University (see Appendix B)

1.2 Selected the population and the sample groups from upper primary school grade 4–6 students, who were officially diagnosed with ADHD in the 2015 academic year using the purposive selection process.

Population and the sample groups: The population and the participants in this present study were students with ADHD who were studying in upper primary schools, in grades 4–6, in the 2015 academic year, in the leading collaborative inclusion model schools of Chiang Mai's Educational Area District 1, Chiang Mai. While this district contains 52 schools, the procedures used by the research to select the school and the students with ADHD are explained below.

1. Found a leading inclusive school in Chiang Mai District's Educational Area 1, in which students with ADHD studied in the same classes as non-ADHD students between primary school 4 - 6. The potential schools were derived from a list given to the researcher by the Special Education Center 8.

2. Purposively selected one school from the 52 schools based upon the number of students with ADHD in the school and the attitudes of the school principal, who agreed to participate to the project. Banchaechang (Teapananukul) School met these standards and was thusly chosen as the setting of this present study.

3. Purposively selected the students with ADHD+EFDs in Banchaechang (Teapananukul) School. The participants studying in upper primary school grades 4–6 in the 2015 academic year had working memory, planning and self-monitoring problems. As mentioned above, the inclusion criteria for participants to join this study included being officially diagnosed as having ADHD, attending regular education classes in the grade 4 to 6 context, a written parental consent to participate in the study, and each child's assent to participate. Conversely, the exclusion criteria for this study included other psychiatric or neurological diagnoses. Based upon these inclusion and exclusion criteria, eight students with ADHD+EFDs participated in this present study.

4. Selected parents of the students with ADHD+EFDs who agreed to sign an informed consent to participate the study. Eight parents chose to participate by signing this consent.

5. Selected the school's principal and the classroom teachers of students with ADHD+EFDs who agreed to sign an informed consent to participate the study. Totally,

one school principal and five classroom teachers chose to participate in this present study as indicated by their signed consent.

6. Selected classroom peers of the students with ADHD+EFDs by soliciting student volunteers; one peer of one of the students with ADHD+EFDs agreed to sign an informed consent to participate in the study.

7. Found an occupational therapist. In the study, the researcher played the dual role of being the researcher and the occupational therapist.

Demographic data of the school and the samples:

Demographic data of the school

Banchaechang (Teapananukul) School is located at 195 Moo 7 Tambon Chae Chang, San Kamphaeng district, Chiang Mai, Thailand. This school was first established on October 1, 1922. The school is comprised of an area of 26,532 square meters and accepts students from kindergarten to upper primary educational levels. Presently, there are 204 students, 108 males and 96 females, at the school. The staff includes 1 director, 13 advisory teachers, 2 teacher's assistants, 1 clerk, 1 computer teacher, and 2 janitors. The school's strategy is to 1) strengthen the student's ability to achieve the national education standards, 2) improve educational personnel to reach the professional standards, and 3) develop school services associated with learning. The mission of Banchaechang (Teapananukul) School is to provide fundamental education, to sustain Lanna culture, to arrange learning methodologies and learning resources with a concept of child – center and to promote satisfying students' habits.

Demographic data of the samples

Characteristics of the samples

The subjects in this study included eight students with ADHD+EFDs, who struggled with working memory, planning and self-monitoring. These students all were, studying in upper primary school grades 4 – 6 during the 2015 academic year, at Banchaechang School. This school has been characterized as a leading collaborative inclusion model school of Chiang Mai's Educational District area 1, Chiang Mai. The team included a parent of the children with ADHD+EFDs, one school principal, five classroom teachers, eight peers of the children with ADHD+EFDs, and an occupational therapist. All of the participants who met the inclusion criteria voluntarily participated in this study. The students with ADHD+EFDs (6 boys and 2 girls) ranged in age from 10 to 12 years old. The parents' ages spanned from 30 to 60 years old. All of the 8 parents in this project were employed at the time of the study. Regarding the parents' level of regular education, one parent (12.50%) did not graduate elementary school, while three parents (37.50%) graduated this level. The remaining parents (50.00%) graduated high school. The teachers in this study included one school principal and five class teachers, who ranged in age between 51 and 60 years old. Four of these teachers (66.67%) self-reported that they held a Bachelor's degree, and two of the teachers (33.33%) graduated with a Master's degree. Regarding the eight student peers of the ADHD+EFDS students who participated in the study ages, like the ADHD+EFDs students, the peer group ranged in age from 10 to 12 years old. This peer group was made up of a majority of boy (6 boys and 2 girls). All participant characteristics are presented in Table 3.1 below.

Table 3.1. Participants Sample

Participant Characteristics		N	%
Students with ADHD+EFDs (N = 8)			
Age	10 years (Grade 4)	2	25.00
	11 years (Grade 5)	1	12.50
	12 years (Grade 6)	5	62.50
	Total	8	100.00
Sex	Boys	6	75.00
	Girls	2	25.00
	Total	8	100.00
Parents (N = 8)			
Age	30 – 40 years	3	37.50
	41 – 50 years	4	50.00
	51 – 60 years	1	12.50
	Total	8	100.00
Level of Regular Education	Under Elementary	1	12.50
	Elementary	3	37.50
	High School	4	50.00
	Total	8	100.00
Career	Employee	8	100.00
Level of Higher Education	Bachelor's Degree	4	66.67
	Master's Degree	2	33.33
	Total	6	100.00

Table 3.1. Participants Sample (continued)

Participant Characteristics		N	%
Teachers (N = 6)			
Position	School Principal	1	16.67
	Classroom Teachers	5	83.33
	Total	6	100.00
Age	51 – 60 year	6	100.00
	Total	6	100.00
Student Peers of students with ADHD+EFDs (N = 8)			
Age	10 years (Grade 4)	2	25.00
	11 years (Grade 5)	1	12.50
	12 years (Grade 6)	5	62.50
	Total	8	100.00
Gender	Boys	6	75.00
	Girls	2	25.00
	Total	8	100.00

1.3. Contacted the school principal and provided information about objectives, methods, and advantages of the research and asked for permission to conduct this research study at the principal's school. The researcher used rapport-building efforts with the school principal, the teachers, the parents, and the peers to build trust and confidence. All stakeholders and participants in this present study signed an informed consent to participate.

1.4. Assessed the students with ADHD's executive functions based upon information gleaned from parents and teachers. This assessment specifically investigated working memory, planning, and monitoring with the Behavior Rating Inventory of Executive Function (BRIEF) (10). A T-score rating was used and children with a score of 65 or over were considered to be clinically impaired. The T-score of eight students with ADHD are presented in Table 3.2. The researcher then asked students with ADHD+EFDs and their parents to participate in the study based upon these test scores. Both parents and the individual child had to agree and sign an informed consent form before being allowed to participate in this study. Next, the researcher divided the participants into four groups: the parent group, the school principal and teacher group, the student with ADHD+EFDs group, and the peer group. After all of the subjects signed an informed consent to participate to the study, the researcher established a convenient meeting day for all four groups to meet. The first meeting period aimed to inform the purpose of the study and all the processes, which would be utilized in the future during the study. Moreover, the researcher made an appointment and a schedule for each subsequent meeting. [This initial meeting was held at 09.00-11.00, on Wednesday 7th October, 2015, in Banchaechang (Teapananukul) School].

Table 3.2. T-score of eight students with ADHD from Behavior Rating Inventory of Executive Function (BRIEF) (N=8)

Students with ADHD	T - score from BRIEF		
	Working Memory	Planning	Monitoring
1	69	70	67
2	78	72	81
3	89	83	91
4	90	85	86
5	83	81	71
6	83	79	83
7	100	98	100
8	90	85	86

1.5 Evaluated both behaviors and abilities in each executive functions component of the students with ADHD+EFDs.

The following data collection tools were used:

1. Working memory: Digits Span: WISC-R (subtest)
2. Planning/organization: Tower of London
3. Monitoring: BRIEF (Parent Form and Teacher Form)

1.6. Developed the data collection tools and therapeutic programs

1.6.1. Data collection tools (see Appendix C) were as follows:

1) Record Forms which were applied from Chinchai (35).

- Problems obtained from the teachers
- Problems obtained from the parents
- Problems obtained from the peers
- Interviews recorded concerning parental understanding of ADHD+EFDs

2) Questionnaires which were based on Chinchai's 2010 (35) study.

- Questionnaires on the understanding of students with ADHD+EFDs amongst the teachers and the peers
- Questionnaires on the teachers' and peers' attitudes

3) Questionnaire on the parents' and teachers' satisfaction (developed by the researcher). The researcher developed the questionnaire to assess the parents' and teachers' level of satisfaction. The original draft of the questionnaire was given to five experts for analysis and evaluation (see Appendix A). The researcher included the suggestions from the experts to guide and improve the original draft in the questionnaire. Thus, to assess content validity, each of these five experts evaluated the content of the questionnaire.

Content validity of the Questionnaire on the parents' and teachers' level of satisfaction was analyzed by using the index of Item Objective Congruence (IOC) method (144). The IOC applied to this questionnaire resulted in an over 0.5 score of all items. The contents of the IOC from five experts are presented in Appendix E. The total average scores were presented in Table 3.3.

Table 3.3. The Content Validity of Questionnaire on the Parents' and Teachers' Level of Satisfaction with the Therapeutic Programs and Collaborative Inclusion Framework for Students with ADHD+EFDs in Upper Primary School

Aspects	Satisfaction Level					IOC average of five experts
	extremely satisfied	very satisfied	moderately satisfied	slightly satisfied	extremely dissatisfied	
	5	4	3	2	1	
The procedure						
1. The solidity of the project's procedure						1.0
2. The aptitude of the project's procedure						1.0
3. Facility of the Project						1.0
4. Knowledge and benefit from activities in each section						1.0
Service provider						
5. Characteristic of the instructor						1.0
6. Considerate communication in each situation						1.0
7. Encouragement on discussion and asking question						1.0
8. Competency to answer questions and give suggestion						1.0
Facility						
9. Location of the project's activities						1.0
10. Adequate equipment in the project						1.0
11. Effectiveness of the media						1.0
12. Public relation activities of the project						1.0
Quality						
13. Beneficial knowledge of the service in the project						1.0
14. Suitability of the knowledge in daily life						1.0
15. Knowledge gained from the project						1.0
16. Equivalence between the project and personal interest						1.0
Total average						**1.0**

1.6.2. The therapeutic programs (see Appendix D) to address problems of executive functions which were directly applied to students with ADHD+EFDs were as follows:

Therapeutic Program 1: Working memory tasks: visuo-spatial working memory task, backwards digit-span, letter-span task and word list recall (computer software format)

Therapeutic Program 2: Planning: maze game (paper and pencil format)

Therapeutic Program 3: Monitoring: Self-monitoring Checklist (paper and pencil format)

The processes in developing and testing the three therapeutic programs were divided into three phases:

Phase 1:

1. The researcher developed therapeutic programs 1, 2, and 3 based upon developmental frame references and various research findings related to working memory intervention for students with ADHD. The therapeutic program from this process was the original draft.

2. The researcher then provided the original draft of the therapeutic program to five experts who had all worked in related fields for at least five years. The content reviews of the five experts are presented in Appendix A. The experts included an occupational therapist, a special education teacher, a general education teacher, a psychiatrist, and a psychologist. Each of the experts evaluated the contents of the therapeutic programs.

Phase 2:

1. Suggestions from the experts to guide and improve the original draft in the therapeutic programs were implemented; thus, this instrument can be viewed as possessing good content validity. After ensuring the validity of the instrument, the researcher then developed the therapeutic program using a computer software format, as well as a paper and pencil format. The computer software format included working memory tasks, visuo-spatial working memory tasks, backwards digit-span, and letter-span task. While the paper and pencil format also included working memory tasks, it also employed word list recall activities, planning task using maze games, as well as monitoring tasks that require the students to use a self-monitoring checklist.

2. Next, the researcher provided therapeutic programs 1, 2, and 3 for 10 students who were diagnose of ADHD and studying in grades 4-6. At the same time, the researcher explored any flaws, for example, unclear or complicated directions or unattractive pictures, in the program's presentation.

Phase 3:

1. The researcher modified therapeutic programs 1, 2, and 3 according to the examination in Phase 2.

2. Then, she further developed the therapeutic programs, as well as created the manual for the computer software format.

Content validity of Therapeutic Programs was analyzed by using the Index of Item Objective Congruence (IOC) method (144). The items in the IOC assessed the relevance of the activities in executive functions (working memory, planning, and monitoring), the sequence of difficulty in the activity (from easy to hard), the content in the activity, the comprehensibility and practicability of the pictures, the practical benefits of the purpose, as well as the language used in the specific activities.

The IOC of Therapeutic Programs produced an overall score of 0.5 of all items. While the contents of the IOC from five experts are presented in Appendix E, the total average scores of the three therapeutic programs are presented in Table 3.4.

Table 3.4. The Content Validity of the Therapeutic Programs in Working Memory, Planning, and Monitoring

Therapeutic Programs	IOC average of five experts
Therapeutic Program 1: Working memory	
Visuo-spatial working memory	1.0
Backwards digit-span	0.9
Letter-span task	0.9
Word list recall	0.9
Therapeutic Program 2: Planning	
Maze game	1.0
Therapeutic Program 3: Monitoring	
Self-monitoring Checklist	0.9
Total average	**0.9**

Characteristics of the therapeutic programs in executive functions for students with ADHD+EFDs

The therapeutic program in executive functions was developed for students with ADHD+EFDs who faced difficulty in the executive function skill of working memory, planning, and self-monitoring. The details in the activities of the therapeutic programs are presented in Table 3.5.

Table 3.5. Characteristics of Therapeutic Programs in Executive Functions for Students with ADHD+EFDs

EF Index	Activities	Format
1. Working Memory	Visuo-spatial working memory	Computer software
2. Working Memory	Letter-span task	Computer software
3. Working Memory	Backwards digit-span	Computer software
4. Working Memory	Word list recall	Paper and pencil
5. Planning	Maze games	Paper and pencil
6. Monitoring	Self-monitoring Checklist	Paper and pencil

The therapeutic program in executive functions

The therapeutic program in executive function included a computer software format and a paper and pencil format**.** The contents of all programs are stated below:

1. Working Memory

1.1 Visuo-spatial working memory (Computer software format)

Purpose: To stimulate and promote the ability to receive and remember information, as well as to organize this information in a practical way that allows it to be utilized.

Equipment: A computer and picture files (Appendix C)

*Activity attribute*s: The child looked at pictures of animals and remembered the animal's positions on the screen. The pictures were shown one after the other and disappeared when the last picture was shown. At the appointed time, the student chose

the position of the picture, which was missing from the screen. Thus, the student was required to recall the location of the animal and to correctly choose the correct pictures.

Instruction: The child carefully looked at the pictures of the animals in the frames on the screen and remembered which animal was in which frame. The pictures would be shown one after the other and then disappear. When the child had looked at the last picture, he/she would hear a ring. The screen would show empty frames, and then the player would move the mouse cursor to the empty frame and clicked on the frame that he/she could remember. The task had to be finished within 10 seconds.

Levels: This activity included 7 levels, containing a total of 35 items with 5 items in each level. Level 1 had 2 bees in a 3 x 3 square. Level 2 had 3 bees in a 3 x 3 square. Level 3 had 2 frogs in a 4 x 4 square. Level 4 had 3 frogs in a 4 x 4 square. Level 5 had 4 frogs in a 4 x 4 square. Level 6 had 3 rabbits in a 5 x 5 square. Level 7 had 4 rabbits in a 5 x 5 square.

Scoring system: One point was granted when the child clicked all of the pictures in one item. Zero points were granted when the student did not click all of the necessary pictures or when the task was not completed in the allotted time. The total maximum score possible on this task was 35 points.

1.2 Letter span tasks (Computer software format)

Purpose: To stimulate and promote the ability to receive and remember information, as well as to organize and utilize this information.

Equipment: A computer and picture files

Activity attributes: The child looked at Thai letters, which were in a row, and were asked to remember the position of each letter of the Thai alphabet. Then, some circles of the letters would appear on the monitor again. After the circles had disappeared, the students would hear a ring, and they would start to complete the task by moving the mouse to the empty circles and clicking on the position of the circles of the letters that they could remember.

Direction: The child carefully looked at letters of the Thai alphabet in the circles on the computer and remembered which letter was in which circle. However, the picture would be shown only one time before it disappeared. Some circles of letters would be shown again, but some letters were missing. Then, the pictures would disappear again. When the player heard the ring, he/she would see empty circles on the screen and would move the mouse to the empty circle to click on the letters that he or she could remember. The player had to choose all of the letters within 10 seconds.

Levels: There were 5 levels in this activity with 5 items in each. The total number of the items was 25. Level 1 had 1 Thai consonant and 4 circles. Level 2 had 2 Thai consonants and 4 circles. Level 3 had 3 consonants and 4 circles. Level 4 had 2 consonants and 5 circles. Level 5 had 3 consonants and 5 circles.

Scoring system: One point was granted when the student clicked on all of the right circles in one item. Zero points were granted when the task was incomplete or when the student exceeded the time limited. This task was worth a total of 25 points.

1.3 Backwards digit-span (Computer software format)

Purpose: To stimulate and promote the ability to receive and remember information and organize it in way to promote using it.

Equipment: A computer and a picture files

Activity attribute: The child looked at numbers in squares in a row and tried to remember all of them. Then, a ring signaled the children to begin the task. The child would see empty squares in a row on the screen, and to answer, the child would type a number into the square in reverse sequence.

Direction: The child carefully looked at the numbers in the squares on the computer screen and tried to remember all of them and their rank. Each number would appear only one time; then the picture would disappear before the bell sounded. Next, there were empty squares on the monitor. The player typed the numbers into the squares by reversing the rank of the number. The goal was to complete this game within 10 seconds.

Levels: There were 4 levels with a total of 40 items in this activity. Each of them contained 10 items. Level 1 had 3 numbers and 3 squares. Level 2 had 4 numbers and 4 squares. Level 3 had 5 numbers with 5 squares. Level 4 had 6 numbers with 6 squares.

Scoring system: One point was granted for typing all of the correct numbers in reverse order in an item and zero points were given if the numbers were not in the rank, if there was an empty square, or if the task exceeded the time limit. Forty points was the highest available number of points for this task.

1.4 Word list recall (Paper and pencil format)

Purpose: To stimulate and promote the ability to receive and remember information and organize it in ways to utilize it.

Equipment: A list of words and a score table were printed

Activity attribute: The child listened to a list of words and remembered them in a rank. After hearing the words only one time, the child was then asked to remember the words in the same order.

Direction: The child listened carefully to the words as the researcher read them and tried to remember all of them in the same order. The words would be heard only one time. Then, the child told all of the words that he/she could remember hearing from the list in the same order within 10 seconds.

Levels: There were 3 levels with 10 items each in this activity. The total number of the items was 30. Level 1 contained four words. Level 2 contained 5 words. Level 3 contained 6 words.

Scoring system: One point was awarded for reporting all of the words in the same order. The student received zero points if he/she could not articulate one of the words, if she/he told the words in the wrong order, or if they exceeded the allotted time for the task. The Total score possible for this task was 30

2. Planning; Maze games (Paper and pencil)

Purpose: To stimulate and promote the ability to deal with a current situation and foster the ability to plan to achieve a specific goal both in the present moment and in the future. This planning ability involves the ability to manage a sustained vision from the beginning to the end of the process.

Equipment: Maze games on paper, a pencil and an eraser

Activity attribute: The child looked at a picture and drew a line from the starting point (entrance) to the end (exit).

Direction: The child drew a line from the starting point, the entrance in the picture, to the end, the exit in the picture.

Levels: In this activity, there were 7 levels; each level contained 5 items. Thus, the total number of items was 35. Level 1 contained 4 layers of squares and one box in the middle. Level 2 contained 5 layers and two boxes in the middle. Level 4 contained 6 layers of square and a box in the middle. Level 5 contained 6 layers of squares and two boxes in the middle. Level 6 contained 7 layers of squares. Level 7 contained 7 layers of squares and 2 boxes in the middle.

Scoring system: The child would receive one point if they could draw a line from the start through the end. The total number of points possible for this task was 35.

3. Monitoring; Self-monitoring Checklist (Paper and pencil)

Purpose: To stimulate and promote children's ability to examine their own action or behaviors during or after a certain activity. Children would determine the applicability of their operation to see whether it was suitable relevant to the target task.

Equipment: Self-monitoring checklist on paper

Activity attribute: The child marked √ or X in the box at each behavior in the class at the end of the lesson. Although the child and the advisory teacher signed their names each time a check was indicated, the classroom teacher would evaluate the list that the students submitted to determine whether the behaviors were actually performed.

Direction: The child ticked √ or X in the box to indicate the presence of a particular behavior the class. After completing all of the five items on the paper and signing his/her name, he/ she submitted the checklist to the researcher on the designated date.

Scoring system: The child received 1 point for each √ that had been approved by the teacher's assessment. However, the child would receive 0 points if he/she marked an X or √ that was subsequently not approved by the teacher. If the students received at least one point, they would earn 1 sticker from the researcher. These stickers may be collected and exchanged for small rewards under the terms and conditions defined by the researcher.

1.7. Another key component of this study was to collect data assessing various stakeholders' understanding of ADHD, as well as to collect and document problems generated by this focus group. This was achieved through meetings composed of two groups. The parents' group and teachers' group included the school principal. The F.S.C. method was used to encourage people who have relationship with the ADHD+EFDs students to participate in developing a therapeutic model; specifically, the groups were asked to consider real-life conditions, for upper primary school students who have ADHD with executive function impairment in school (35). The details of the steps used in this stage of the study's methodology are described below.

(1) First, data collection started with dividing the participants into three groups; the parents' group, the teachers' group, and the ADHD+EFDs student group. Then, questionnaires focusing on the teachers' general understanding and attitudes towards students with ADHD+EFDs were administered. For the parents' group and ADHD+EFDs student group, the researcher collected data through in-depth interviews. The interviews were analyzed using two separate recorded forms--one for the parents and one for the ADHD+EFDs students. Both of these forms have been included in Appendix C).

The research pre-established an accuracy rate of 80% for both the teachers and parents. If this accuracy rate was present, then the researcher would omit giving knowledge about ADHD. However, if the score was under the pre-determined accuracy rate, a comprehensive program for ADHD would be held for the parents and the teachers. The questionnaire among the teachers and the interview with the parents would reveal whether these groups had a solid knowledge-base about ADHD as indicated with a score of over 80%. However, according to F.S.C. method, all of the groups still required basic knowledge about ADHD, as well as needed further training about relevant ways to support the children, specifically in the children's behavior and study. Consequently, the research developed and conducted an informational session to address this lack of knowledge about ADHD. This training was held during the operation stage.

(2) Secondly, The F.S.C method began with the parents', teachers' and the school principal's reflections in the focus group. The focus groups' discussion was used to explore their perspectives. It took two days in Banchaechang (Teapananukul) school to collect the data using this F.S.C method. The scheduled activities for these two-day meetings follow:

The Teachers' Group

Day 1: Meeting Schedule (Session 1: The Teachers' group)

Topic: Identifying the collaborative concepts of the programs for students with ADHD.

Date and time: Friday, November 6, 2015, from 09.00-12.00.

Time	**Activities**
09.00-09.30	Registration
09.30-10.00	The researcher and the research assistant (note taker) were introduced before stating the purpose of the meeting.
10.00-10.40	The teachers and the school principal analyzed and discussed past situations. All of the participants in this group discussed the question stated below; "**Question one**: *In the past, five to ten years ago, did you have any opinions about how to best identify problems in managing an educational inclusion approach for ADHD students in Thailand who affect or relate to you and your students?"*

At this time, everyone presented their own ideas while the research assistant wrote all the ideas on a large flipchart in the conference room. After that, the teachers read and analyzed the information in their group. The researcher encouraged group members to share and comment on the derived information.

10.40-11.00 Coffee break

11.00-12.00 All of the participants in this group analyzed and synthesized the current situation. They discussed the following question:

Question two: *"In the current situation, do you have any opinions about problems of managing an educational inclusion approach for ADHD students who affect or relate to you and your students?"*

At this time, everyone presented their ideas, while the research assistant was writing all of the ideas on the flipchart. After that, all of the members read and analyzed the information in their groups. The researcher encouraged group members to share and comment on all of the information.

Question three: *"From the past to present, what kinds of activities have been either a success or a failure in managing an educational inclusion approach for ADHD students?"*

In this stage, while the group members expressed their opinions, the researcher who also worked as an occupational therapist drew a mind-map, which is one of the techniques in F.S.C. that was used to identify major issues and to quickly classify and group the topics and details as the themes emerged in the discussion. Next, the therapist gave the participants five stickers each and asked them to use the stickers to indicate the top five important themes. The therapist reviewed all of their opinions at the end of this session.

The Parents' Group

Day 1: Meeting schedule (session 2; parents' group)

Topic: Identifying the collaborative concepts of programs for students with ADHD.

Date and time: Friday, November 6, 2015, time 13.00-16.00.

Time	**Activities**
13.00-13.30	Registration
13.30-14.00	The researcher and the research assistant (note taker) were introduced and explained the purpose of the meeting.
14.00-14.40	The parents analyzed situations in the past. All participants in this group discussed the question stated below. **Question one**: *"In the past, five to ten years, did you have any opinions about how to best identify problems in managing an educational inclusion approach for ADHD students in Thailand who affect or relate to you and your children?"* At this time, all the participants presented their own ideas, and the research assistant wrote all the ideas on the flipchart paper that had been prepared in the conference room. After that, all the participants read and analyzed the information of the others in the group.
14.40-15.00	Coffee break
15.00-16.00	All parents in this group analyzed and synthesized the current situation. They discussed the question stated below. **Question two**: *"In the current situation, do you have any opinions about problems with managing an educational inclusion approach for ADHD students which affect or relate to you and your children?"* At this time, everyone presented their ideas, while the research assistant wrote them down on the flipchart paper. After that, each member read and analyzed the information in the group. The researcher encouraged group members to share and comment on all of the information.

Question three: *"From the past to present, what kinds of activities have succeeded or failed in managing an educational inclusion for children with ADHD?"*

In this stage, while the group members expressed their opinions, the occupational therapist drew a mind-mapping, one of the techniques in F.S.C. Similar to the teachers' group, the therapist then gave the participants five stickers to fix onto the themes they considered to be most important. The therapist summarized all of their opinions at the end of this session.

As the schedule above illustrations, during the first day of the meetings, the parents' group and the teachers' group separately discussed and identified problems in managing an educational inclusion approach for students with ADHD+EFDs. This group focused on the past and current situations. During the second day of the meetings, a mixed group of parents and teachers discussed, explored and reached agreement regarding the collaborative concepts of a therapeutic program or action plans for students with ADHD in the future. The schedule for the second meeting day has been included below.

Mixed group

Day 2: Meeting schedule

(Mixed group--Session 3:* The Parents, the Teachers and the School Principal*)

Topic: Identifying the collaborative concepts of programs for students with ADHD.

Date and time: Sunday, November 8, 2015, from 09.00-12.00.

Time	**Activities**
09.00-09.30	Registration
09.30-10.00	The researcher and the research assistant (note taker) were introduced and the purpose of the meeting was stated. All of the members in the group reached an agreement on concepts of program provision or action plans for ADHD in the future; a mixed group of parents and teachers discussed the question stated below.
10.00-11.00	**Question**: *"For the future, do you have any opinions about a program provision or action plans for your student which will*

encourage them to succeed in their academic goals and will enable them to maintain appropriate behaviors?"

In this stage, all of the participants brainstormed ideas, reflected their opinion, shared experiences, discussed, and analyzed the information to create a collaborative concept of an ideal future. The information included past successes that could be continued, as well as failures that should be avoided. The participants were given five stickers to fix onto the activities, which they thought to be the most important, suitable, or possible in the near future. Finally, all of the participants determined a collaborative future vision using the program provision or action plans for students with ADHD.

11.00-12.00 The meeting concluded and lunch break began.

1.8. Develop projects for parents, teachers (including the school principal), peers, and students with ADHD+EFDs; the resources and information used in the project development were based on the conclusion from the F.S.C. meetings and the reflection from focus groups of students with ADHD+EFDs. The results of F.S.C. meetings were obtained from all of the participants. They reflected their perspectives of the action plans, which they thought the most important, suitable and possible in the near future. The top four strategies in collaborative concepts that were chosen by the teams were (1) using a computer software program at school, (2) employing a buddy system at school, (3) giving knowledge to people relating to the students at school and home, and (4) collaboration among the teachers, the parents, and the therapist.

1.9. Record the students' GPA in the first semester, 2015.

2. Operation Stage

Collaborative program team members included the occupational therapist, the parents, the teachers, the school principal, the student peers, and the students with ADHD+EFDs.

The research process steps in the operation stage were as follows:

2.1 Arranged informational projects for the parents, the teachers, the school principal, and the peers.

The resources used in the projects were based upon the information obtained in stage 1.8. The therapist analyzed all of the information from the participants and also considered the activities that supported the ADHD+EFDs students' participation in their occupation.

The projects in the study consisted of the following:

(1) Projects for parents, teachers, the school principal, and peers:

- The project for parents: Strategy training and a home program for parents.

- The project for teachers and the school principal: Strategy training and a classroom management program for teachers.

- The project for peers: Peers training programs; The Buddy Program and Classroom peer training.

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

2.1.1 The project for parents: Strategy training and a home program

The objectives of this project were as follows:

(1) To develop the parents' perception in the characteristics of students with ADHD+EFDs including symptoms of ADHD, executive function deficits, and the strategies which are suitable to help address these deficits.

(2) To develop the parents' support for their child at home through a strategic training and home program, which included knowledge about techniques to monitor the child at home.

Procedures:

This project focused in the action plans at home by the parents. The information of the project was based on F.S.C. method. The results of F.S.C. indicated that the parents had a lack of knowledge about ADHD and needed more information about strategies to support their child at home. The projects began after the end of the F.S.C. meetings.

1. The occupational therapist (the researcher) taught about the symptoms of ADHD, executive function deficits, and suitable strategies to address these needs. After giving knowledge, the researcher reevaluated the parents' understanding of ADHD through interviewing. (Date and time: Sunday, November 8, 2015, time 13.00-16.00. at Banchaechang School.)

2. The therapist trained and prepared the parents in a home program to support the students with ADHD+EFDs at home. The program included a monitoring program, homework management, preparing classroom material for next day, and encouraging positive behavior of their child after school. The parents assisted the students' by using a checklist form for homework assignments (see Appendix D). They used a planning form (see Appendix D) to plan the students' roles after school and to prepare them for the next day. Then they applied a point system to track homework completion. The parents reported this data to the researcher, who phoned the parents each week for 7 weeks (1 time per week).

In conclusion, the occupational therapist initially collaborated with the parents by planning all the activities that were suitable for their children. Then, the therapist implemented this project with the parents, by checking and adjusting the activities to be the most appropriate. (Date and time to call: Every Sunday from November 29, 2015 to January 10, 2016.)

Plan-Do-Check-Act (PDCA) cycle:

The first inspection on November 29, 2015, indicated that the students with ADHD + EFDs forgot to bring their checklist home to show their parents. Moreover, some parents admitted that they also forgot to check the child's homework according to the checklist. The researcher solved these problems by repeating the importance of this program and encouraging the parents to enhance the positive behavior of their child after school. Moreover, the researcher reminded the parents to check the students' homework in the checklist and planning form for planning the role of the students' with ADHD+EFDs' roles after school and preparing for the next day.

On Sunday December 6, 2015, the researcher called the parents again for the second monitoring and evaluation session and found that some parents still sometimes forgot to check the checklist. The researcher addressed this problem by telling all of the students with ADHD+EFDs to remind their parents about the checklist every day after school. Moreover, the researcher applied a point system by giving a score when they could complete the task.

In the last period between Sunday 13th December, 2015 and Sunday 17th January, 2016, the parents showed the best cooperation according to the monitoring and evaluation call, they paid attention to their child's activities at home and followed the home program to monitor and to regularly check the students' homework via the checklist.

2.1.2 The project for teachers and the school principal: Strategy training and a classroom management program for teachers were utilized.

The objectives of this project were as follows:

(1) To develop the teachers' and the school principal's perception of students with ADHD+EFDs including symptoms of ADHD, executive function deficits, and the strategies which may help address these deficits.

(2) To develop the teachers' and the school principal's ability to support the children in the school environment through the classroom management program, to educate the teachers and principal about techniques and classroom strategies, and to coach

the teachers and principal to be able to effectively monitor the students with ADHD+EFDs in the classroom.

Procedures;

This project focused on the action plans in the school setting by the teachers and the school principal. The information of the project was based on the F.S.C. method. The results of the F.S.C. indicated that the teachers had a lack of knowledge about ADHD and needed more information about strategies to support the students with ADHD+EFDs in the classroom. The project began after the completion of the F.S.C. meetings, but also operated along with the other projects (e.g. the project for the parents, the peers, and the students with ADHD+EFDs). The projects for the teachers focused on strategy training and classroom management techniques to assist student with ADHD+EFDs in the class. Some of these strategies are listed below.

- Place the student's seat at the front of the class or closed to the teacher and other good students.

- Locate the student's desk a minimal distance from the door or the windows to prevent excessive provocation.

- Assign certain beginning and ending times for each class activity and frequently inform the students of the laspse of time.

- Encourage the students to note the class work and the framework.

- Persuade the students to underline the main idea of the lesson with diffent colours.

- Seperate complicated activities into clear, short and comprehensible parts.

- Promote a behavioural record for the students to note and review their habits including and requiring teacher input, feed back, and suggestions.

- Use teacher proximity to foster on-task behavior. For example, when students start to lose control of themselves, such as being noisy or ignoring class work, try standing close to them, cautioning them verbally or touching them on the shoulder as a warning.

- Positively stimulate the students to behave more properly.

1. The school principal is the key person who plays an important role in the school's provision and management focusing on collaborative educational inclusion approaches to involve special education children with other children in mainstreamed

classrooms. The school principal is the authority figure who makes decisions relating to events at school. In this present study, the researcher gave information about the study's objectives, methods, and advantages of the research in order to seek permission from the school principal to join this study. The researcher used rapport-building strategies with the school principal to build trust and confidence in the merits of this study. Likewise, 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. Some of these strategies include environmental modifications, such as placing the student with ADHD+EFDs' desks at the front of the classroom and next to a good peer or buddy's, reducing the visual distraction stimuli in the classroom, etc. (84). Next, the researcher reevaluated the understanding of ADHD and the attitude among the teachers and school principal through questionnaires. (Date and time: Saturday, November 7, 2015, time 13.00-16.00. at Banchaechang School.)

2. The researcher/occupational therapist trained and prepared the teachers for the classroom management program to support the students with ADHD+EFDs in the classroom and the school setting. These programs included strategies to support the students with ADHD+EFDs 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. Their task was to assist the ADHD+EFDs students' with their assignments and to check the self-monitoring checklist form (like the ADHD+EFDs' student form) after class. The researcher/therapist, then, used the results of the checklist to plot a graph showing the students' performance (see Appendix D) and to provide helpful feedback. The researcher/therapist compared the self-monitoring checklist forms and the results to identify any discrepancies before giving the student a sticker. A reward would be granted when the student had collected 10 stickers. The researcher/therapist met the teachers every week for 7 weeks (1 time per week) to follow the project, to observe the classroom, to record the ADHD+EFDs students' behavior, as well as to meet with teachers about the previous week's progress.

In conclusion, the researcher/therapist collaborated with the teachers by planning all of the activities, which were suitable for their students. Additionally, the researcher implemented this project with the teachers, checked, adjusted and refined the

activities to make them as effective as possible. (Date and time to meet the teachers: Every Friday from November 29, 2015 to January 10, 2016.)

Plan-Do-Check-Act (PDCA) Cycle:

In the first meeting for monitoring and evaluating, which was held on Friday December 4, 2015, it was found that the problems of the program were that the students with ADHD+EFDs forgot to hand their checklists to the teachers at the end of the class. Two teachers admitted that they also forgot to check and sign ADHD+EFDs students'self-monitoring checklist form. The other teachers said that they forgot to do the classroom management program for the students with ADHD+EFDs. As a result, the researcher solved these problems by encouraging all of the teachers to monitor and check the students' checklist after the class. Moreover, the researcher provided a one-page document of the classroom management program to further emphasize the teachers' vital role in this process.

During the second week of the monitoring and evaluation (Friday, December 11, 2015 to Friday, December 18, 2015), the school had two national holidays and numerous extracurricular activities, which impacted the continuity of the project. The researcher suggested that the teachers do the program as much as possible on the teaching days.

In the third monitoring and evaluation period, which was between Friday, December 18, 2015 and January 22, 2016, the researcher observed the classes and recorded the behaviors of both the ADHD+EFDs students, as well as the behaviors of their teachers. The teachers cooperated and followed the program acceptably. For example, the researcher observed that the teachers placed the student with ADHD+EFDs near the front of classroom and let a good peer or buddy sit next to them in the classroom. From the behavioral observation in the classroom, the students with ADHD+EFDs stayed still, and were not impulsive; however, some of the students were distracted and talked with peers while the teacher was teaching.

2.1.3 The project for peers: Peers training program

The objectives of this project were as follows:

(1) To develop the peers' perception and understanding about typical characteristics in students with ADHD+EFDs, including symptoms of ADHD.

(2) To develop the peers' support for the students with ADHD+EFDs in the school environment through giving information of how to help the students with ADHD+EFDs in the classroom.

Procedures:

The researcher divided the project that into two programs. Both of these programs are listed and explained below.

1. The Buddy Program (8 peers). Peer students volunteered to be the buddy based upon input from the teachers to select the most suitable candidates to join the program. This project focused on the action plans in the school setting by the peers. The information included in this project was based upon the results from the F.S.C. meetings. The results of the F.S.C. indicated that most teachers and parents suggested employing a buddy system to help the students with ADHD. The students who were buddies helped the ADHD students at school. They believed that a supportive friend would have a positive impact on the behavior and school performance of the children with ADHD in the classroom. The project began after the end of the F.S.C. process and operated along with the other projects (the project for the parents, the teachers including the school principal, and the students with ADHD+EFDs).

(1) The researcher/therapist provided information about the symptoms of ADHD and how to help the students with ADHD+EFDs in the classroom. (Date and time: Thursday, November 12, 2015, time 14.30-16.30 at Banchaechang School.)

(2) The researcher trained and prepared the buddy's roles for the student peers in the collaborative program to support 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). The researcher met all of the buddies every week for 7 weeks (1 time per week) to follow the project.

Plan-Do-Check-Act (PDCA) Cycle:

In the monitoring and evaluation initial stage which was held on Thursday, December 3, 2015, the problems of the program were that the students with ADHD+EFDs did not cooperated or follow buddies' suggestions. Some of the students with ADHD+EFDs argued while the buddies gave immediate feedback in the classroom. In order to address this issue, the researcher gave specific techniques to all buddies in how to give helpful feedback, as well as how to use proper body language when communicating with their ADHD+EFDs friends.

In the meeting of the following week, which was held on Thursday, December 17, 2015, two of the buddies reported that the same problems persisted. As such, the researcher attempted to mitigate these problems by rehearsing and role-playing ways to talk with the students with ADHD+EFDs. The researcher emphasized the importance of the peer role.

During the final week (Thursday, January 7, 2016 and Thursday, January 12, 2016) the buddies reported that the students with ADHD + EFDs were more cooperative than in previous weeks. The researcher still emphasized need for the buddy and gave each student positive reinforcement.

2. Classroom peer training (55 peers). This project focused on all classroom peers' perception of ADHD+EFDs students' characteristics and how these characteristics were seen in the classroom. The researcher met with all of classroom peers during a single meeting at school to orientate them and help them to understand the nature of children with ADHD+EFDs. The researcher also explained ways to approach the students with ADHD + EFDs in the classroom. Before and after giving this information, the researcher evaluated and reevaluated the peers' understanding of ADHD and their attitude towards ADHD students through questionnaires. [Date and time: Thursday, November 20, 2015, time 14.30-16.30. at Banchaechang (Teapananukul) School.]

2.2 Implemented the therapeutic programs in executive function for students with ADHD+EFDs (see the detail of the program in Chapter 4) Drawing upon the researcher's expertise as an occupational therapist, this component of the present study sought to enhance the executive functions, specifically in working memory, planning, and self-monitoring, of the sample group (the students with ADHD+EFDs). The total duration was 21 times within 7 weeks. The group attended the program 3 times a week, and the program took 1 hour each time (16, 41). [Date and time to receive the therapeutic program: Every Wednesday, Thursday and Friday, November 11, 2015 to January 22, 2016, time 14.30-15.30 at Banchaechang (Teapananukul) School except national holidays and the dates in which the school had special activities]. The details are shown in Figure 3.1.

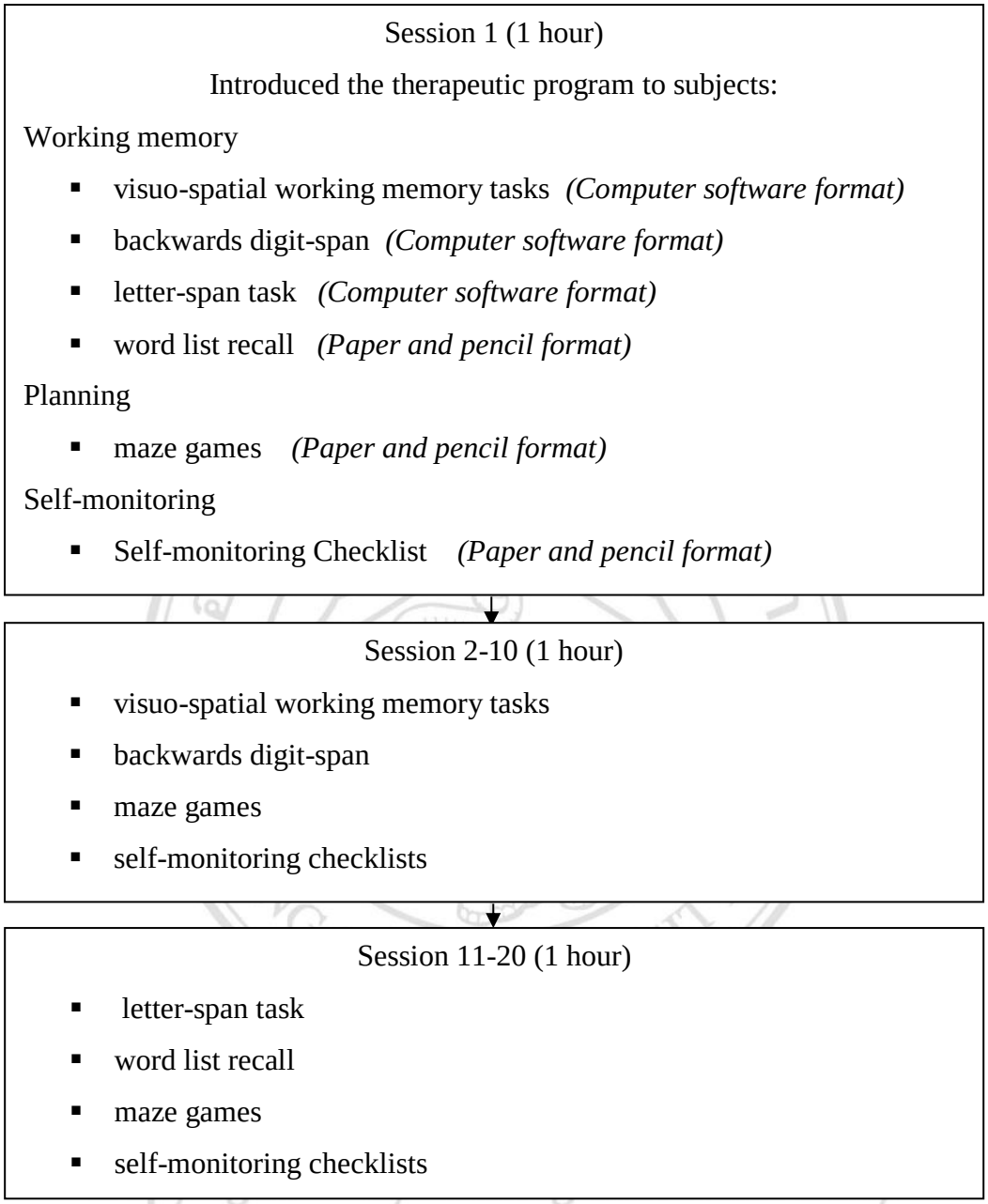

Figure 3.1. Therapeutic Programs in Executive Functions for Students with ADHD+EFDs

As Figure 3.1 highlights, four tasks were administered to the student each day. Each task took approximately 15 minutes to complete, which means that the students completed all tasks in one hour each day. In the computerized training program, the students advanced in levels of difficulty based upon accuracy. The difficulty increased in the upper level and if students did three incorrect trials, they had to rotate to another task. The next day, the student had to start from the first level of tasks.

For working memory tasks visuo-spatial working memory, backwards digit-span, letter-span task and word list recall were used. Both visual and auditory stimuli were presented sequentially on the computer screen as the students tried to remember their order and location and to respond by clicking the mouse or typing on the keyboard.

For the planning activity maze games were administered to the students each day. Again, each game took approximately 15 minutes to complete. The games were presented in a paper and pencil format, in which the students were asked to navigate through a maze while they were being chased by enemies that they had to avoid.

The therapeutic program in executive functions for students with ADHD+EFDs set individual levels of task difficult for each child. Each task took 15 minutes, but the time was flexible depending on the child's concentration and the ability to solve the task. The tasks were not placed in any sequential order and were changeable. The child was given three trials and if he/she made a mistake, the therapist adjusted the level of difficulty. Each task contained all levels of difficulty, but always started at level 1. In the later sessions, the child's speed increased.

In the therapeutic program in executive functions for students with ADHD+EFDs, a self-monitoring checklist was administered to the students each day. They were asked to complete this checklist after three subjects in the morning. Their teachers would evaluate the checklist that the students submitted in order to see whether the behaviors were actually performed and to sign their names each time. The students turned in their checklist to the researcher on the established date, and the researcher gave them feedback and useful reinforcement.

3. Evaluation Stage

Collaborative program team members included the occupational therapist, the parents, the teachers, the school principal, and the student peers

The Research steps included in evaluation stage were as follows:

3.1 Evaluated the efficiency of the program for boosting executive functions specifically of the working memory, planning, and self-monitoring, by using the data collection tool--BRIEF

3.2 Evaluated both the behaviors and abilities in each component of executive functions of students with ADHD+EFDs

The data collection tools were as follows:

- Working memory: Digits Backward - WISC-R (subtest)
- Planning/organization - Tower of London
- Monitoring - BRIEF

3.3 Evaluated the collaborative inclusion study pattern for primary school students with ADHD+EFDs using level changes based on the students' GPA in the first semester, 2015, as well as based upon parents' and teachers' satisfaction with the model.

Data collection tools were as follows:

- Questionnaires and in-depth interviews with parents' and teachers' regarding their level of satisfaction with the model
- Students' GPA

4. Data analysis

Data analysis procedures were conducted according to types of data in the study as follows:

4.1 The demographic data of the subjects and data obtained from questionnaires (questionnaires concerning the understanding of students with ADHD+EFDs amongst the teachers and the peers, the teachers' and peers' attitudes, and the parent's and teacher's satisfaction) were analyzed using descriptive statistics including frequency, mean, standard deviation, median, quadrant deviation, and percentiles. The qualitative data obtained from in-depth interview for assessing the satisfaction of participants.

4.2 The focus group interview data obtained from the Record Forms were be analyzed using a qualitative thematic analysis approach. The researcher coded the data manually using a highlighter and color pens to identify key words and concepts of the data. Then, different codes were sorted out into themes by using mind map before the researcher reviewed, analyzed and created the name of each theme. Finally, the data was reported with some quotations from the original data.

4.3 The pre-test and post-test scores obtained from the Executive Function Assessment tools were computed to compare the disparity within group using the Wilcoxon Matched-Pairs Signed-Ranks Test.

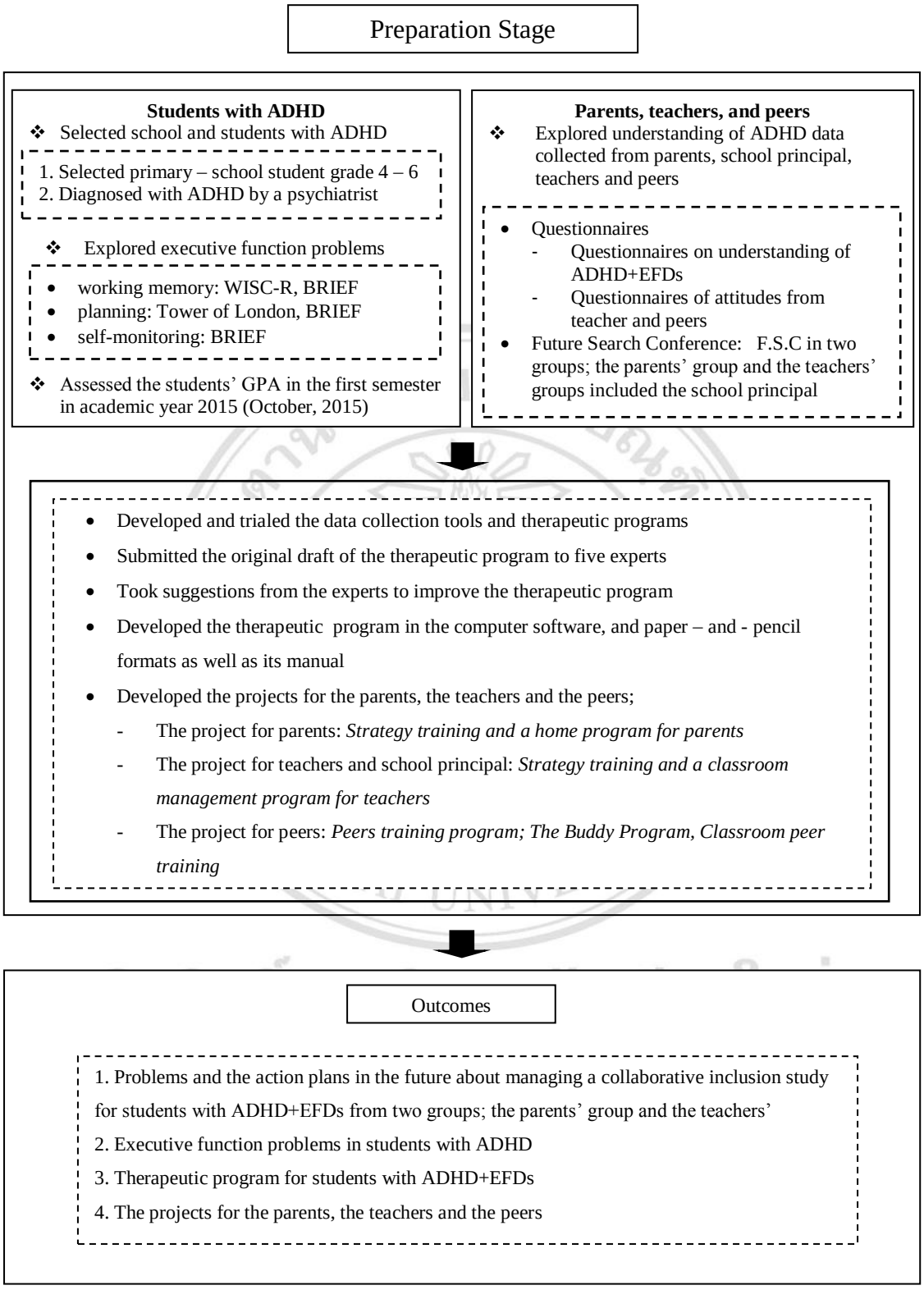

Figure 3.2: Research Process and Outcomes in Preparation Stage

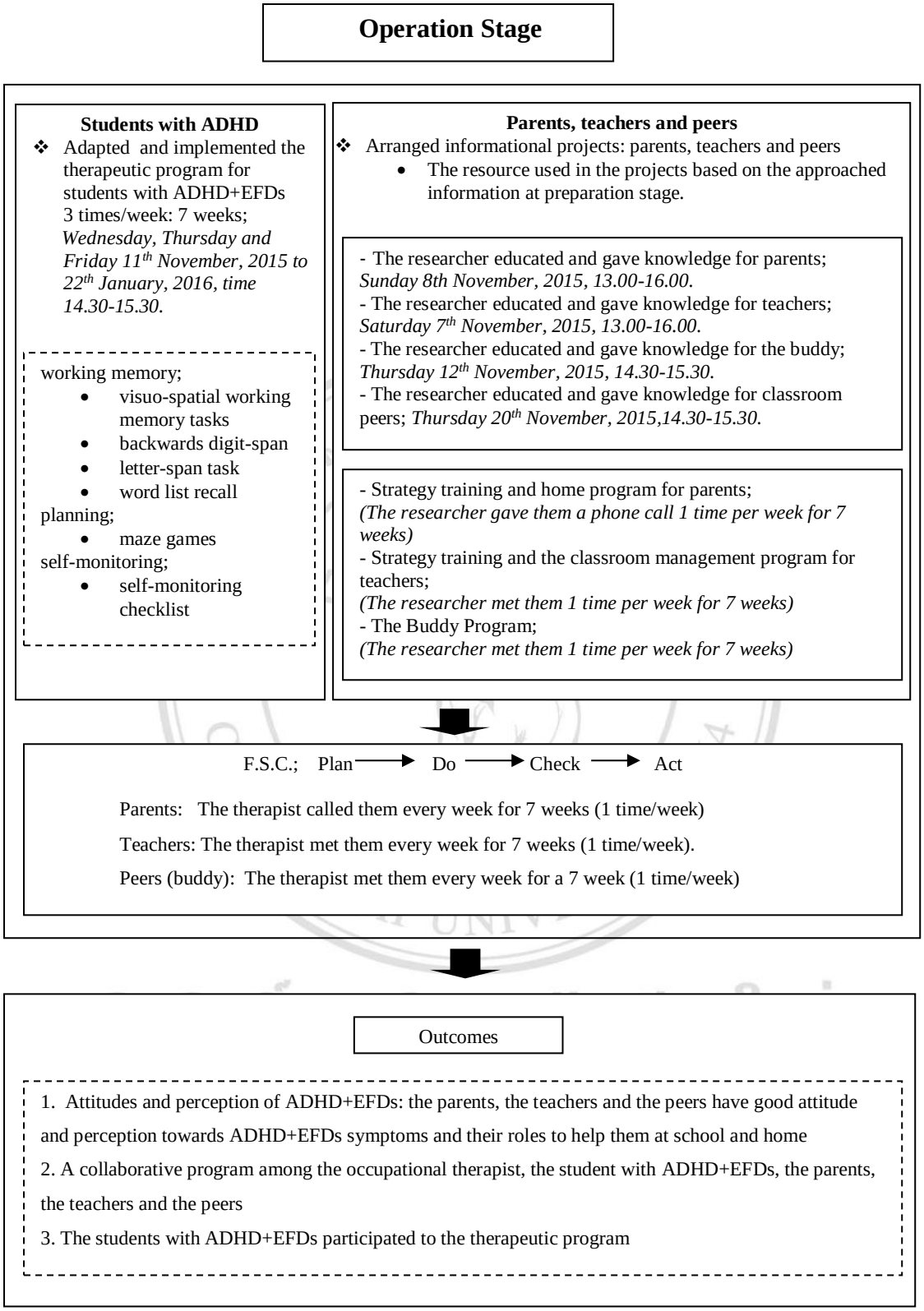

Figure 3.3: Research Process and Outcomes in Operation Stage

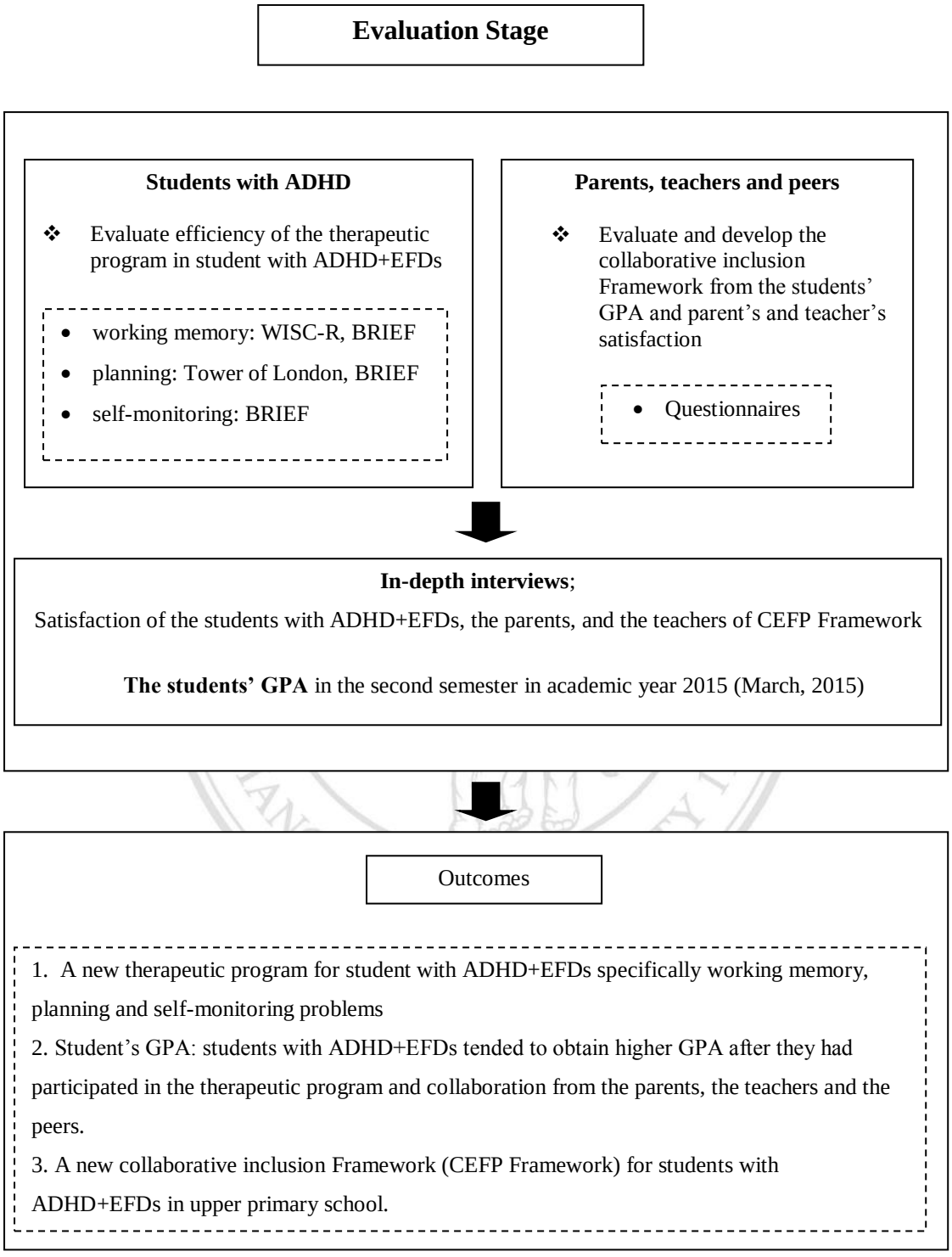

Figure 3.4: Research Process and Outcomes in Evaluation Stage