

## CHAPTER IV

### RESULTS AND FINDINGS

#### 4.1. Introduction

This research study aimed to develop an English course using assistive technology for students with ADHD's learning achievements, creativity and self- efficacy. The samples of this study were 5 students with ADHD at Chiang Mai Rajabhat University Demonstration School. This chapter presents the findings of the study which are as follows: the component that should be incorporated into an English course and the effectiveness of the developed course in terms of students' learning achievements, creativity and self- efficacy. The results and findings are reported both quantitatively and qualitatively as follows:

**Research question 1:** What components should be incorporated into the English course using assistive technology?

In order to respond to this research question, needs analysis was conducted and related literature was reviewed. Next, the course components were drawn from the needs analysis and the review of related literature. Then, the derived components were incorporated in the developed course.

#### 4.2. Needs analysis

##### 4.2.1. Needs analysis results

##### 1. Documentary study

For the documentary study, related documents and literature were studied, analyzed and synthesized in order to obtain information about students with ADHD' learning styles and preferences, as well as appropriate learning materials. Moreover, the appropriate academic instructional practices and activities together with the instructional tools, physical learning environment and behavioral interventions were investigated. The following table illustrates students' learning styles and preferences, appropriate learning materials together with academic instructional practices and activities.

**Table 4.1. ADHD students' learning styles and preferences**

Learning styles and preferences
<ul style="list-style-type: none"> <li>- Carefully structured with academic lessons</li> <li>- Auditory learners (talking and listening preferences)</li> <li>- Visual learners (Preferences of diagrams, puzzles, charts and other graphically organized information) charts, maps, posters, films, videos, and visuals</li> <li>- Kinesthetic learners (activities that are experiential, concrete, and physical)</li> <li>- Breaks between study sessions</li> </ul>

**Table 4.2. Key competencies, appropriate teaching materials and teaching support**

Key competencies, appropriate teaching materials and teaching support				
Key competencies				
Thinking	Using language, symbols and texts	Self Management	Relating to others	Participating and contributing
Concept				
Better understand, organize and play with ideas, recount and summarize their experience, predict, question and analyze in different ways	Present new information in a range of ways to develop ADHD students understanding and knowledge of the language, symbols, and texts	Tools that support concentration and attention help ADHD to learn	<ul style="list-style-type: none"> <li>-Feel easy to relate and interact with friends</li> <li>-Take advantage of possible individual strength</li> </ul> (leadership, Empathy, Humor, Creativity)	Provide opportunities into the classroom that build on the strengths and interests of students with ADHD.
Teaching materials				
Mind mapping	Print materials,	Something to	Hands on /particular	Performance

<b>Key competencies, appropriate teaching materials and teaching support</b>				
	texts	fiddle with	activities	
Visual, graphic and oral symbols and text resources	Interactive media, Video	Permission to move	Group work, Pair work	Creative tasks and leadership
Role play	Role playing, netbooks, laptops, graphic organizing, software and tools.	Time clock	Knowledge share	Music and art
Teaching support				
Breaking down information	Digital tools rather than handwriting.	Provide something to fiddle with	Group activities	Physical movement
Making clear connection between ideas and concepts	Addressing individual's learning styles and preferences	Permission to move about	High levels of spontaneity and physical activity.	Provide activity to help ADHD students focus
Make sequencing explicit	Providing adequate learning facilities	Exercise	Activity related to and interact with their peers	Provide activity to help ADHD students maintain attention and retain understanding
Having information presented in non-written formats  (pictures, video clips, graphics)	Providing adequate time needed by individual	Movement games	Task activity	Provide activity to help ADHD students to take part and respond to what is going on in the classroom
Use visual tools	Providing technical support	-	-	-



**Table 4.3. Behavioral interventions, physical learning environment and academic instructional practices and activities**

Behavioral interventions	Physical learning environment	Academic instructional practices and activities
<ul style="list-style-type: none"> <li>- Avoid statements and actions you know the student will react to.</li> <li>- Provide opportunities to take breaks, physical exercise and movement and get refreshed</li> <li>- Establish routines, schedules and organizational habits with the class.</li> <li>- Write down homework instructions and give a verbal outline.</li> <li>- Check students' medication</li> <li>- Remind students of any self-management strategies they know.</li> <li>- Facilitate relaxation.</li> <li>- Move closer or move away as appropriate, stand side-on rather than face-on.</li> <li>- Remind them of any self-management strategies they know.</li> <li>- Gain their attention and use visual cues and gestures, if necessary</li> <li>- Make use of physical activity and opportunity to move around</li> <li>- Introduce humor.</li> <li>- Improve students' awareness of time, reinforce the class rules and boundaries and</li> <li>- Zip a sugary drink</li> </ul>	<ul style="list-style-type: none"> <li>- Reduce class noise</li> <li>- Seat students away from high-traffic and distracting areas</li> <li>- Allocate space for students to move about in or sort through resources</li> <li>- Remove objects that may distract the student.</li> <li>- Change the time, location or duration of activities, if these factors are viewed as influencing difficult behavior.</li> <li>- Redirect the student to another activity they enjoy.</li> <li>- Change where the student sits.</li> <li>- Adapt chairs for seated movement,</li> <li>- Use seated cushions or air-filled cushions for side-to-side movement on chairs and standing desks for standing movement.</li> <li>- Use standing desks for standing movement.</li> </ul>	<ul style="list-style-type: none"> <li>- Verbally prompt students to settle</li> <li>- Often remind them with message</li> <li>- Avoid giving homework at the end of the school day</li> <li>- Provide simple and clear speech</li> <li>- Tell the student simply what is required and model what is expected, if necessary.</li> <li>- Set achievable goals, monitor and provide feedback along the way.</li> <li>- Note key times for maintaining attention</li> <li>- Allow fewer written tasks and more opportunity to present ideas visually or orally.</li> <li>- Provide a sequence of actions or steps and follow up</li> <li>- Break down larger or longer tasks into smaller manageable chunks.</li> <li>- Set buddies, peer tutoring</li> <li>- Give extra time for students to process information.</li> <li>- Help consolidate learning through repetition and linking to life experience.</li> <li>- Incorporate hands on, practical ways to learn about topics such as science and technology</li> <li>- Encourage creative thinking with graphic organizing software and tools</li> <li>- Allocate additional time to complete tasks.</li> <li>- Help consolidate learning through repetition and linking to life experience.</li> <li>- Scaffold tasks for students who do not do this for themselves for example, beginning, middle and end framework.</li> <li>- Plan for a range of 'interruption tasks', such as delivering messages.</li> </ul>

## 2. Semi-structure interview

Semi-structured interview is the second instrument used for obtaining the data for needs analysis. The semi-structured interviews were done with 5 primary ADHD students who attended the course, their parents and 3 teachers who taught the samples at site.

### a) Semi-structured interview with ADHD students

The interviews with 5 primary students with ADHD were conducted. The gathered information is presented in Table 4.4.

**Table 4.4: Learning styles and preferences and academic and behavioral needs**

Student	Learning styles and preferences and academic and behavioral needs
1	Watching video, game , no writing, no drawing
2	Watching video, game, drawing, creative task, working in groups
3	Watching video, game, writing, drawing, creative task
4	Watching video, game, writing, drawing, work in group
5	Watching video, game, drawing, creative task

Notes: No student indicated his or her strengths and special needs.

### b) Semi-structured interview with ADHD students' parents

The interviews with 5 ADHD students' parents were conducted. The gathered information is presented in Table 4.5.

**Table 4.5: Learning styles and preferences and academic and behavioral needs indicated by ADHD students' parents**

Student	Learning styles and preferences and academic and behavioral needs
1	Watching video, game, creative task, no writing, creativity, poor academic achievements, prefer being alone
2	Watching video, game, speaking , creative task, average academic achievements, prefer being alone
3	Watching video, game, drawing, creative task, poor academic achievements, prefer to be with others
4	Watching video, game, writing, drawing, creative task, average academic achievements, prefer being alone
5	Watching video, game, drawing, speaking, creative task, very poor academic achievements, prefer to be with others

c) Semi-structured interview with ADHD students' teachers

The interviews with 5 students with ADHD' teachers were conducted. The gathered information is presented in Table 4.6.

**Table 4.6: Learning styles and preferences and academic and behavioral needs indicated by ADHD students' teachers**

Student	Learning styles and preferences and academic and behavioral needs
1	Watching video, listening, creative task, poor academic achievements, prefer movement
2	Watching video, speaking, creative task, average academic achievements, prefer movement
3	Watching video, writing, drawing, creative task, poor academic achievements, prefer movement
4	Watching video, writing, speaking, drawing, creative task, average level of achievements, prefer movement
5	Watching video, game, drawing, speaking, creative task, poor academic achievements, prefer movement

**Table 4.7: Summary of information from needs analysis obtained from the semi-structured interviews**

Information from ADHD students	Information from ADHD students' parents	Information from ADHD students' teachers
<ul style="list-style-type: none"> <li>-Watching video, game (Visual-auditory learners)</li> <li>- Watching video, game, working in group (Visual-auditory learners)</li> <li>- Watching video, game, writing, drawing, working in group(Visual-auditory-kinesthetic learners)</li> <li>- Watching video, game, writing, drawing, work in group(Visual-auditory-kinesthetic learners)</li> </ul>	<ul style="list-style-type: none"> <li>- Watching video, game (Visual-auditory learners)</li> <li>- Watching video, game, speaking (Visual-auditory learners)</li> <li>- Watching video, game, drawing, working in group(Visual-auditory-kinesthetic learners)</li> <li>- Watching video, game, writing, drawing (Visual-auditory-kinesthetic learners)</li> </ul>	<ul style="list-style-type: none"> <li>-Watching video, listening (Visual-auditory learners)</li> <li>- Watching video, speaking (Visual-auditory learners)</li> <li>- Watching video, writing, drawing (Visual-auditory-kinesthetic learners)</li> <li>- Watching video, writing, drawing (Visual-auditory-kinesthetic learners)</li> </ul>



**Table 4.8: Specific and important findings from needs analysis**

<p><b>Learners and learning styles</b></p> <ul style="list-style-type: none"> <li>• Visual-auditory-kinesthetic learners</li> <li>• Watching video, game, writing, drawing, working in group</li> <li>• Individual's learning styles and preferences</li> </ul> <p><b>Academic instructional practices and activities</b></p> <ul style="list-style-type: none"> <li>• Connection between ideas and concepts</li> <li>• Information presented in non-written format</li> <li>• Breaking down information</li> <li>• Creative tasks and leadership</li> <li>• Interactive media, Video</li> <li>• Digital tools rather than handwriting.</li> <li>• Providing technical support</li> <li>• Simple and clear speech informing what is required and model what is expected</li> <li>• Learning through repetition and linking to life experience.</li> <li>• Science and technology topics</li> <li>• Creative thinking and scaffolding</li> </ul> <p><b>Behavioral interventions</b></p> <ul style="list-style-type: none"> <li>• Provide opportunities to take breaks, physical exercise and movement and to get refreshed</li> <li>• Breaks between study sessions</li> <li>• Careful structure</li> </ul> <p><b>Physical learning environment</b></p> <ul style="list-style-type: none"> <li>• Class noise and distraction reduced</li> <li>• Allocate space for students to move about in or sort through resources</li> <li>• Adequate learning facilities and time needed by individual</li> </ul>
<p><b>Suggestions for course development</b></p> <ul style="list-style-type: none"> <li>• Breakdown information</li> <li>• Focus on individual learning styles and preferences</li> <li>• Focus on digital tools focus</li> <li>• Use interactive media, Videos</li> <li>• Learn through repetition</li> <li>• Focus on creative task focus</li> <li>• Use non-written format information</li> <li>• Use creative tasks</li> <li>• Link to life experience</li> <li>• Allow physical exercise and movement to refresh</li> <li>• Allow breaks between study sessions</li> <li>• Reduce class noise and distraction</li> <li>• Provide Learn facilities and time needed to individuals</li> </ul>

#### 4.2.2. Mapping of the results of the need analysis to find course components

The results of needs analysis were mapped in order to obtain the components required for the development of the course as shown in table 4.9.

**Table 4.9: The course components drawn from mapping results of the needs analysis.**

English for ADHD students using a task-based approach
The course content ( From needs analysis)
Content Short reading story
<b>Teaching and learning activities (From needs analysis)</b>
<b>Materials:</b> Audio-visual applications with interactive storytelling inputs Interactive media, video Mobile applications: iPad, smart phone Application of Atlas Mission, Matilda, and Four Season, Sand Draw, My Story
<b>Learning activities:</b> Easy task-based learning, Information gap task Writing and drawing task
<b>Behavioral interventions</b> <ul style="list-style-type: none"> <li>• Provide opportunities to take breaks, physical exercise and movement and to get refreshed</li> <li>• Breaks between study sessions</li> <li>• Careful structure</li> </ul>
<b>Physical learning environment</b> <ul style="list-style-type: none"> <li>• Reduced class noise and distraction reduce</li> <li>• Allocate space for students to move about in or sort through resources</li> <li>• Adequate learning facilities and time needed to individual</li> <li>• Quite room</li> </ul>
<b>Evaluation practice</b> <ul style="list-style-type: none"> <li>• Pre-test and post-test</li> <li>• Questionnaire</li> <li>• Observation</li> <li>• Interview</li> </ul>

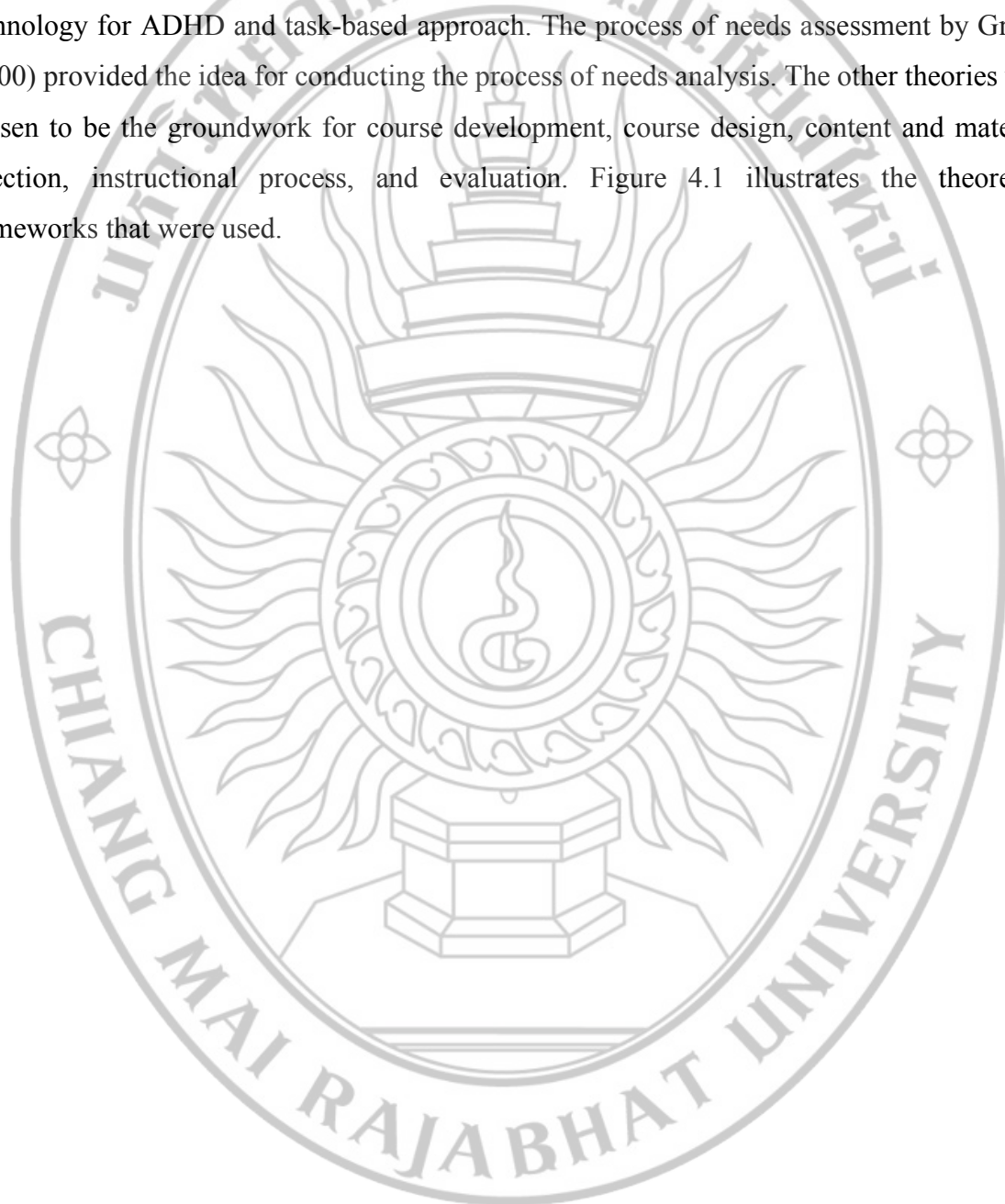
All the above illustrated components were used to develop the course that met the needs



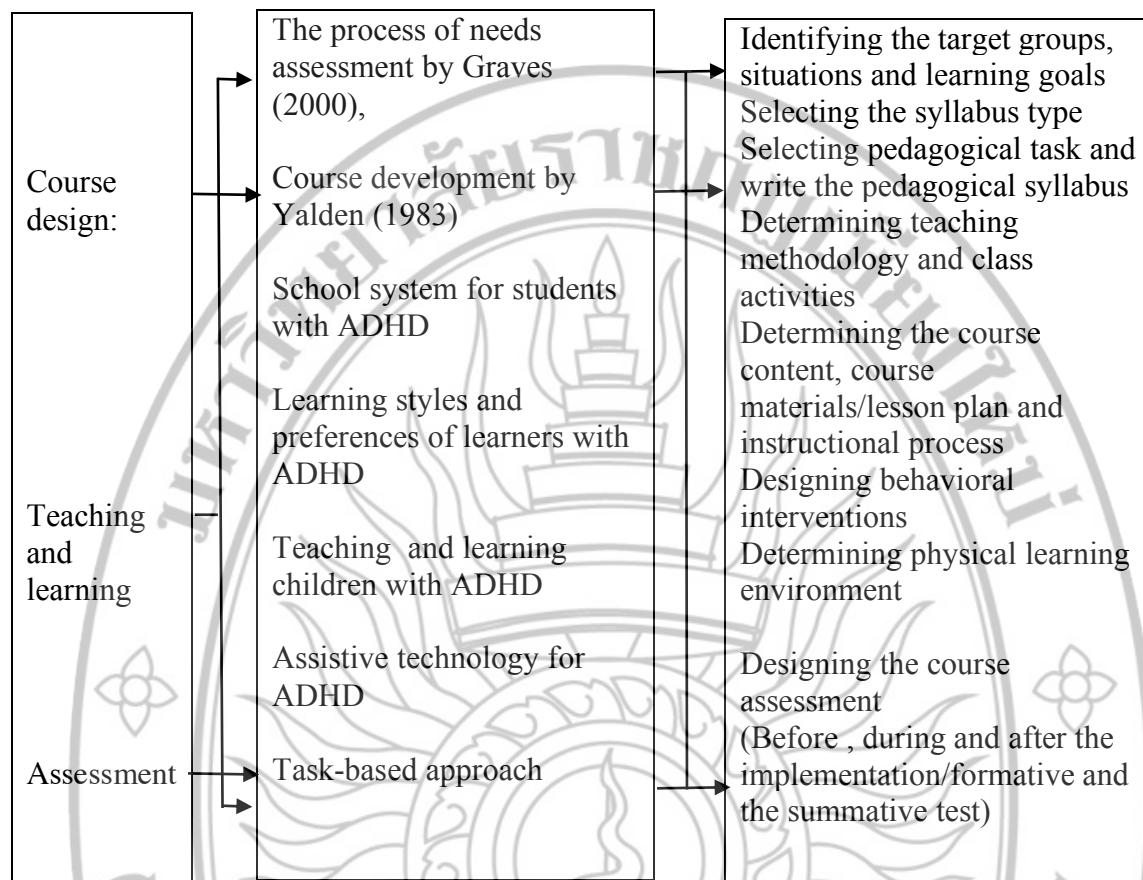
### 4.3. Course development

#### 4.3.1. Exploring theoretical frameworks for the course development

In order to develop a specific framework for the course, several related theoretical frameworks were explored. They were the process of needs assessment by Graves (2000), course development by Yalden (1983), school system for students with ADHD, learning styles and preferences of learners with ADHD, teaching and learning children with ADHD, assistive technology for ADHD and task-based approach. The process of needs assessment by Graves (2000) provided the idea for conducting the process of needs analysis. The other theories were chosen to be the groundwork for course development, course design, content and materials selection, instructional process, and evaluation. Figure 4.1 illustrates the theoretical frameworks that were used.



**Figure 4.1: The theoretical frameworks for English course, using assistive technology for students with ADHD.**



### 4.3.2. Course development

English for students with ADHD was developed based on the needs analysis. Steps undertaken in developing this course were as follows:

Step 1. Determining the goals and objectives of the course

Step 2. Selecting the syllabus type

Step 3. Writing a proto syllabus: select pedagogical tasks

Step 4. Writing a pedagogical syllabus for students with ADHD: designing the course and writing lesson plans for course implementation.

Each step performed was as follows:

#### **Step 1. Determining the course goals**

The goals of the developed course were derived from the results of the needs analysis. The goals of the course focused on students' ability to read effectively, creativity and self-efficacy.

Goals of English for ADHD students :

1. To enhance students' ability in reading comprehension
2. To foster students' creativity
3. To enhance students' self-efficacy

#### **Step 2. Selecting the syllabus type**

In regard to the teaching methodology and learning activities, a pedagogical task-based learning approach was applied in this study.

#### **Step 3. Writing a proto syllabus**

1. Establish academic instructional practices, teaching support, behavioral interventions, physical learning environment.

Due to the prior background knowledge and learning styles and preferences of this group of students with ADHD, who need special care and desire to effectively enhance their potentiality in their learning achievement as well as their creativity and self-efficacy, students' learning styles and preferences were focused on the complexity of the language and content. Moreover, learning contents and activities used in the course of teaching needed to be designed in a way to meet ADHD students' background knowledge, attention and interests. In terms of complexity of the language and knowledge, easy English language with audio-visual materials were the main target language.



## 2. Select and sequence tasks

Tasks used in this study were pedagogical tasks selected based on learning styles and preferences of students with ADHD, which were obtained from the need analysis. These tasks were called visualized composition tasks. The tasks provided the students an opportunity to draw pictures, and to create and compose their stories by describing the pictures in English. Students made use of the ideas and language from the interactive storytelling that they had been exposed to or learned during the pre-task stage for their task guidelines. They also made use of their teacher as a resource when they had difficulties with the language, or in case they required assistance with sentence structures and necessary vocabulary.

### **Step 4. Writing the pedagogical syllabus: designing the course and writing lesson plans for course implementation.**

#### 1. Design the course

The course components

##### 1.1. Course content (What to learn)

The course content of the developed course included 3 sets of interactive storytelling by audio-visual applications. The stories included general contents and were stories interesting to children at a school age. The selected stories included “Matilda In Australia”, “If I could touch the sky” and “Four Seasons.” The applications selected included the audio-visual applications of ‘Atlas Mission Application’, ‘StarfallFun To Read Application’ and ‘Four Seasons Application’.

##### 1.2. Teaching and learning activities

###### a) Course materials

For course materials, the researcher chose authentic English listening inputs with a variety of stories associated with relevant and selected language functions and tasks. The selected interactive storytelling had been reviewed and suggested by the experts and developers for appropriateness for learners at their particular age group. The selected applications included audio-visual applications of “Matilda In Australia by Atlas Mission Application”, “If I could touch the sky by StarfallFun To Read Application” and “Four Seasons by Four Seasons.”

###### b) Teaching methodology (How to learn)

In regard to teaching methodology and learning activities, easy task-based language learning from Willis, 1996 was adopted. The selected tasks were listing, ordering and sorting, sharing personal experiences and creative tasks. The applied tasks covered 3 stages of teaching in this study as follows:

**Table 4.10: Task-based lesson framework proposed in this study**

<p><b>Pre-task stage</b></p> <p>To prepare students to perform the task, objectively facilitating language acquisition</p>	<p>Phase 1. Introduction to topic and task including activities, which help prepare them with vocabulary and language they make use of in the next phase</p> <p>Phase 2. Reading comprehension with interactive storytelling in selected applications</p>
<p><b>Task-cycle</b></p>	<p>Task Planning Task performance</p>
<p><b>Language focus</b></p>	<p>Attention to problematic forms/ Analysis of problematic linguistic features</p>

c) Instructional process

For instructional process, easy task-based language learning frameworks for task-based lessons by Willis (1996) was adapted and was applied in this study. The framework for task-based lessons covered pre-task, task cycle and language focus. The pre-task stage provided students necessary vocabulary and some sentence structures so that they observe specific language features, which would be beneficial to them during the task cycle stage. For the task cycle stage, students were required to do visualize composition tasks (drawing and writing tasks) both individually and in small groups. Next, students presented their work to the class orally. For the last stage, language focus, the teacher gave feedback about problematic linguistic features of the presented task.

1.3. Student evaluation

For the assessment plan, a reading comprehension test and students' visualize composition tasks were applied. Moreover, informal interviews and teacher's fieldnotes were used to evaluate students' self-efficacy.

2. Writing lesson plans for the course implementation.

The modules and lesson plans were written accordingly. The first lesson plan comprised of pedagogical task 1, interactive storytelling 1. The second lesson plan incorporated pedagogical task 2, interactive storytelling 2. The third lesson plan incorporated pedagogical task 3. Simply put, this study offered three pedagogical tasks. Table 4.11 below illustrates the overview of the English course using a task-based approach for ADHD students.

**Table 4.11: below illustrates an overview of the English course, using a task-based approach for ADHD students.**

Sample lesson plan: Pedagogical tasks :
<p>Interactive storytelling 1: Matilda In Australia by Atlas Mission Application          Interactive storytelling 2: If I could touch the sky by StarfallFun To Read Application          Interactive storytelling 3: Four Seasons by Atlas Mission</p>
<p>Performance objectives of pedagogical task 1-3:</p> <ol style="list-style-type: none"> <li>1. Students will be able to understand the necessary vocabulary shown in the story</li> <li>2. Students will be able to understand the story and provide the correct answers to the story comprehension questions</li> <li>3. Students will be able to create and describe the similar story of their own using the applications</li> </ol>
<p>Teaching and learning activities:</p> <p>Pre-task activities</p> <ol style="list-style-type: none"> <li>1. Introducing the topic and set achievable goals</li> <li>2. Exposure to necessary vocabulary and sentence structures</li> <li>3. Listing or matching sheets regarding the vocabulary</li> <li>4. Exposure to interactive storytelling             <ol style="list-style-type: none"> <li>4.1. Students read, listen to and interact with an interactive storytelling app</li> <li>4.2. Teacher monitors and provides feedback along the way</li> <li>4.3. Teacher scaffolds tasks for students who need help in both mechanics and academic issues, if necessary</li> <li>4.4. Students answer the reading comprehension questions orally</li> </ol> </li> </ol> <p>Teaching materials</p> <ol style="list-style-type: none"> <li>1. Vocabulary application / sheet</li> <li>2. Listing or matching sheets</li> <li>3. Matching game</li> <li>4. Interactive storytelling applications</li> <li>5. Question sheet</li> </ol> <p>Task-cycle activities:</p> <ol style="list-style-type: none"> <li>1. Students were assigned to work in pairs performing similar visualize composition tasks</li> <li>2. Students studied the mechanics and features of the application used for performing visualize composition tasks</li> <li>3. Students discussed and planned what they wanted to add in their composition.</li> <li>4. Students performed visualize composition tasks</li> <li>5. Teacher monitors and provides feedback along the way</li> <li>6. Teacher scaffolds tasks for students who need help in both mechanics and academic issues, if necessary</li> <li>7. Students show their tasks</li> </ol>



Sample lesson plan: Pedagogical tasks :
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Teaching materials
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- |   |
|---|
| <ol style="list-style-type: none"> <li>1. Task sheet</li> <li>2. Applications of SandDraw, My Story and Puppet Wshop for visualize composition tasks</li> </ol> |
|---|

Language focus activities
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- |   |
|---|
| <ol style="list-style-type: none"> <li>1. Learners ask questions regarding the problematic language or linguistic features.</li> <li>2. Teacher gives feedback and explains some the problematic language or linguistic features, if necessary</li> </ol> |
|---|

#### 4.4. Course verification

This English technology assisted course was developed based on a combination of information from needs analysis and related literature. The task-based approach was used as teaching methodology. In order to ensure that the course was effective and met the needs, the developed course validation was performed in the following ways.

##### 4.4.1. Experts' validation

The course lesson plans together with course materials were validated by a panel of three experts. The content validity was measured by Item-Objective Congruence (IOC) Index at .05. One expert suggested the repetition of vocabulary from activities as well as some group work rather than focusing on pair work during class activities. The first interactive storytelling was somewhat difficult and too long. The adjustment was done accordingly following the expert's comments and suggestions.

##### 4.4.2. The Pilot study

The pilot study was done with a student with similar learning styles and preferences three days prior to the main study. One pedagogical task was continuously piloted for 12 hours over three days with one ADHD student, who was in the same grade (Grade 5). The pilot study was administered in a similar learning location of the actual teaching place. The topic of the learning task was interactive storytelling 1, Matilda In Australia.

In the pre-task stage, the teacher introduced the topic and task. Next, the student was exposed to the needed vocabulary and associated language features through handouts and applications, containing the necessary vocabulary and language features. Then, he did the task with listing or matching vocabulary. Next, he read, listened, watched and interacted with

selected interactive storytelling in applications. Then, he answered the comprehension questions based on the story he had been exposed to. For the task cycle stage, the student planned for the visualize composition tasks (drawing and writing tasks). Finally, he carried out the tasks. At the language-focus stage, the problematic language features found in the visualize composition task were explained.

The results of the pilot study provided information regarding the content, materials, class activities and time allotment. It can be inferred from the findings that by the complexity of the content and mechanical features of the applications, the vocabulary application should be used together with the vocabulary sheet, which should follow afterwards and in small chunks in order to enhance the recognition and memorization of the students. The sequence of the interactive storytelling should be arranged according to the complexity of the content and mechanical features of the applications. Moreover, more time should be added.

#### **4.4.3. Course modification**

The lesson plans were adjusted for appropriateness according to the suggested information by the experts' comments and the pilot study's results. The vocabulary applications were used together with the vocabulary sheet, which followed afterwards and in small chunks. Some activities were done in a group of three. The first interactive storytelling was replaced with an easier and shorter interactive story. The interactive storytelling was sequenced according to the complexity of the content and mechanical features of the applications. Moreover, more time was given to each activity.

### **4.5. Course implementation and evaluation**

#### **4.5.1. Course implementation**

The course was implemented in the second semester of the year of 2017 with 9 sessions, 36 hours in total. The participants were 5 primary school students with ADHD at Chiang Mai Rajabhat University Demonstration Schools.

#### **4.5.2. Course evaluation**

This part describes the finding of the study according to the second research question.

**Research question 2:** How effective is the English course using assistive technology?

**Research question 2.1.** Will the scores of the students' post-test be significantly higher than those of the pre-test?

**Research question 2.2.** What is the degree of student creativity?

**Research question 2.3.** What is the degree of students' self-efficacy?

#### 4.5.2.1. Learning achievement

Several instruments were used to gather the information both in terms of quantitative and qualitative aspects. The results and findings are reported both quantitatively and qualitatively as follows:

**Research question 2.1.** Will the scores of the students' post-test be significantly higher than those of the pre-test?

The scores of English reading comprehension pre-test and post-test were rated. The scores of the pre-test and post-test were tested by a Paired-Samples t-test. The difference was significant at a .05 level of confidence. The results from the t-test are presented in table 4.12.

**Table 4.12: English reading comprehension ability test (Paired-Samples t-test)**

Test	n	X	S.D.	df	t	Sig (2-tailed)
Pre-test	5	2.00	.707	4	-11.000	0.000
Post-test	5	4.20	.837			

\*p<0.05

From Table 4.12, the t-value of -11.000 from the t-test indicates that the students' post-test scores in the English reading comprehension test were significantly higher than their pre-test scores ( $p < 0.05$ ). Therefore, hypothesis 1 was accepted.

#### 4.5.2.2. Students' creativity

**Research question 2.2.** What is the degree of student creativity?

The data of students' creativity were from the visualize composition tasks done by students.

##### **The result of students' creativity**

To determine students' creativity, the students' visualize composition tasks were used to collect the data for the study. The rubric for assessing students' creativity was adapted from Brookhart (2013). The rubric covered four different levels of creativity that were very creative(4), creative(3), ordinary/routine(2), and imitative(1). The rubric also covered four different areas including variety of ideas and contexts, variety of sources, combining ideas, and communicating something new. The result of students' creativity analysis using the students' visualize composition tasks and rubric revealed that they showed higher levels of creativity in their visualize composition task performances. The results from the t-test of students' creativity are presented in table 4.13.



The pre-test and post- test were rated. The scores of the pre-test and post-test were tested by a Paired- Samples t-test. The difference was significant at a .05 level of confidence. The results from the t-test are presented in table 4.13.

**Table 4.13: Students' creativity (Paired-Samples t-test)**

Test	n	X	S.D.	df	t	Sig (2-tailed)
Pre-test	5	1.60	.547	4	-4.427	0.011
Post-test	5	3.60	.547			

\* $p < 0.05$

From Table 4.13, the t-value of -4.427 from the t-test indicates that the students' post-test scores in creativity of visualize composition tasks were significantly higher than their pre-test scores ( $p < 0.05$ ). Therefore, hypothesis 2 was accepted. The students' creativity has been summarized and is presented below.

#### Student 1

##### Pre-test



##### Post-test



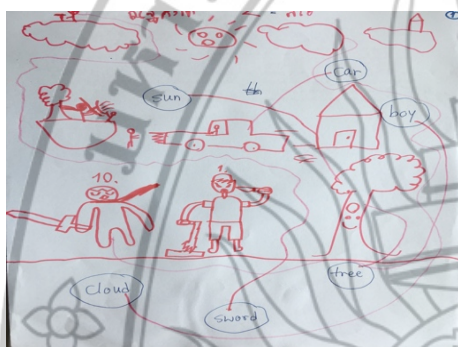
Pre-test: Student 1 uses ideas that are standard in children's drawing: a neighborhood scene with five people with a house, some sky, high buildings and a rice field and so on. The picture looks similar to many other children's drawing. The idea represents some concepts from the same contexts or disciplines. The scene of the picture represents the student's personal daily context. The student refused to write anything and just handed in the assignment.

Post-test: He uses media provided in the application and created a picture. The picture incorporates two new ideas: his holiday at the lake and the garbage problem and solution. In terms of creativity, his post-test work was more original and creative than his pre-test work. He wanted to present interesting concepts from different contexts or disciplines. The student

created product drawing on a variety of sources and made use of the teacher as a resource person. The student also made use of some language he was exposed to from the interactive storytelling (Four seasons) and had asked the teacher to help with the difficult language that he needed for his composition. The student's creative and interesting ideas are combined in original ways to address an issue, and to solve a problem, or to make something new. He presented a new original way to solve the garbage problem that he had met during his holiday by inventing a new garbage keeping of his own.

### Student 2

#### Pre-test



#### Post-test

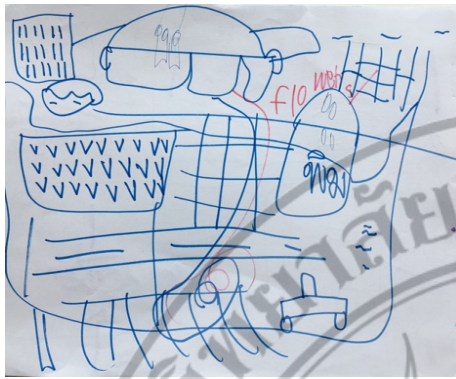


Pre-test: Student 2 uses ideas that are standard in a girl drawing: A fighting scene with five people with some weapons, where one got some cuts and scratches on his body. The idea represents some concepts from the same contexts or disciplines. The scene of the picture represents the student's personal daily common context. The student refused to write anything and just handed in the assignment.

Post-test: She used media provided in the application and created a picture. The picture incorporates two new ideas: family holiday and personal inner perception towards her family context. In terms of creativity, her post-test work was more original than her pre-test work. She intended to present important concepts from different contexts or disciplines. The student created product drawing on a variety of sources including personal experiences and made use of the teacher as a resource person. The student made use of some language that she was exposed to from the interactive storytelling and had asked the teacher to help with the difficult language that she needed for her composition. The student's creative and interesting ideas are combined in original ways to solve a problem, address an issue, or to make something new. She expressed her feeling and perception towards her family and tried to point out the facing problem.

### Student 3

#### Pre-test



#### Post-test



Pre-test: Student 3 uses ideas that is ordinary drawing: A girl in a farm scene with a lot of rice fields. There is a shelter and a simple carriage in the scene. The picture looks similar to many other children's drawing. The idea does not represent important concepts. The scene of the picture represents the student's personal daily common context. The creativity in her work is derived from the assignment, which required students to draw anything she wanted. The student refused to write anything and just handed in the assignment.

Post-test: She used media provided in the application (My Story) and created a picture. The picture incorporates two new ideas: her peaceful backyard and possibility of three different kinds of animals playing together. In terms of creativity, her post-test work was more original than her pre-test work. She intended to present important concepts from different contexts or disciplines. The student created a product drawing on a variety of sources, including personal experiences and made use of the teacher as a resource person. The student made use of some language she was exposed to from the interactive storytelling (Maltida by Atlas Mission Application) and had asked the teacher to help with the difficult language that she needed for her composition. The student's creative and interesting ideas are combined in original ways to convey something new. She expressed her perception towards the possible community of the different kind of animals living together.



## Student 4

**Pre-test**



**Post-test**

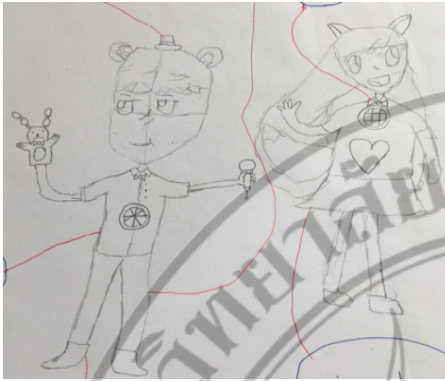


Pre-test: Student 4 used ideas that are standard in a boy drawing: A fighting scene with five people with some weapons and one got some cuts and scratches on his body. The idea represents some concepts from the same contexts or disciplines. The scene of the picture represents the student's personal daily common context. The student refused to write anything and just handed in the assignment.

Post-test: He used media provided in the application (Puppet WShop) to create a picture for his composition. The picture expressed the ideas of the ability to do things he wants to do. In terms of creativity, his post-test work was more expressive and creative and original than his pre-test work. He intended to present important concepts from different contexts or disciplines. The student created product drawing on a variety of sources, including personal experiences and made use of the teacher as a resource person. The student made use of some language he was exposed to from the interactive storytelling for his composition. The student's creative and interesting ideas are combined in original ways to address an issue. He expressed his feeling and perception towards his family and school.

## Student 5

### Pre-test



### Post-test



Pre-test: Student 5 used ideas that are standard in children drawings: An ordinary scene with a sailor and the Moon, the transformation of a school girl to search for a magic artifact, and a Tuxedo Mask. These cartoon animation characters are known by school children. The idea represents some concepts from the same contexts or disciplines. The scene of the picture represents the student's personal interest. The student spent the entire time on his picture and did not write anything on the assignment.

Post-test: He used media provided in the application (My Story) to create a picture for his composition. The picture expressed the ideas of scary creatures and the spread of them all over the place. In terms of creativity, his post-test work was more expressive, creative and original than his pre-test work. He intended to present important concepts from different contexts or disciplines. The student created a product drawing on a variety of sources, including personal experiences and made use of the teacher as a resource person. The student made use of some language he was exposed to from the interactive storytelling for his composition. The student's creative and interesting ideas are combined in original ways to address an issue. He expressed his feeling and perception towards his facing environment.

#### 4.5.2.3. Students' self-efficacy

**Research question 2.3.** What is the degree of student self-efficacy?

The data of students' self efficacy was from the self-efficacy checklist and the teacher's fieldnotes. In order to determine students' self-efficacy, a questionnaire and the teacher's fieldnotes were used in order to collect the data for the study. The scale for assessing students' self-efficacy was adapted from Gaumer et al. (2016). The result of students' self-efficacy was analyzed using the students' self-efficacy questionnaire with Likert scale. The information

obtained from the student self-efficacy questionnaire revealed that they showed higher levels of self-efficacy on their checklist. Some of the students' self-efficacy questionnaire has been summarized and is presented below.

### 1. The result of students' self-efficacy analysis using the questionnaire

At the end of the study, the students were required to complete a set of self-efficacy questionnaires. In its full form, the questionnaire consisted of 10 items. The questionnaires contained the Likert scale of five gradations: 5 = strongly agree, 4 = agree, 3 = neutral, 2 = disagree, 1 = strongly disagree. Descriptive statistics on means and standard deviations of each indicator of belief of student self-efficacy using SPSS are presented in table 4.14.

**Table 4.14: Descriptive statistics on evaluation of student self-efficacy**

Indicator of Belief	n	Mini- mum scale	Maxi- mum scale	Mean	Std. Deviation
1. I can always manage to solve difficult problems if I try hard enough	5	3.00	4.00	3.60	.548
2. I can solve most problems if I invest the necessary effort	5	3.00	4.00	3.60	.548
3. It is easy for me to stick to my aims and accomplish my goals	5	3.00	5.00	4.00	1.000
4. I can learn what is being taught in class this year	5	4.00	5.00	4.60	.548
5. I can figure out anything if I try hard enough	5	3.00	4.00	3.60	.548
6. If I practiced every day, I could develop just about any skill.	5	4.00	5.00	4.60	.548
7. I am confident that I will achieve the goals that I set for myself.	5	3.00	4.00	3.60	.548
8. I believe hard work pays off.	5	4.00	4.00	4.00	.000
9. I think that no matter who you are, you can significantly change your level of talent.	5	3.00	4.00	3.60	.548
10. I can change my basic level of ability considerably.	5	4.00	5.00	4.60	.548
Total	5	3.00	4.40	3.98	-

Note: n= Number of students in this study



From table 4.14, it can be noticed that the average mean value items 1-10 is 3.98. The mean values of the student self-efficacy indicators range from 3.60 and 4.60. The average value of minimum scale is 3 and that of maximum scale is 4.40.

Information obtained from the self-efficacy questionnaires has been summarized and is presented in table 4.15 below.

**Table 4.15: information from student self-efficacy questionnaire**

Students' self-efficacy	n	Frequency (%)	Sum categories (%)
1. I can always manage to solve difficult problems if I try hard enough			
Strongly agree	0	0%	
Agree	3	60%	60%
Neutral	2	40%	40%
Disagree	0	0%	
Strongly disagree	0	0%	
Total	5	100%	100%
2. I can solve most problems if I invest the necessary effort			
Strongly agree	0	0%	
Agree	3	60%	60%
Neutral	2	40%	40%
Disagree	0	0%	
Strongly disagree	0	0%	
Total	5	100%	100%
3. It is easy for me to stick to my aims and accomplish my goals			
Strongly agree	2	40%	
Agree	1	20%	60%
Neutral	2	40%	40%
Disagree	0	0%	
Strongly disagree	0	0%	
Total	5	100%	100%
4. I can learn what is being taught in class			
Strongly agree	0	0%	
Agree	3	60%	60%
Neutral	2	40%	40%
Disagree	0	0%	
Strongly disagree	0	0%	
Total	5	100%	100%
5. I can figure out anything if I try hard enough			
Strongly agree	0	0%	
Agree	3	60%	60%
Neutral	2	40%	40%
Disagree	0	0%	
Strongly disagree	0	0%	
Total	5	100%	100%
6. If I practiced every day, I could develop just about any skill.			

Students' self-efficacy	n	Frequency (%)	Sum categories (%)	
	Strongly agree Agree Neutral Disagree Strongly disagree Total	0 3 2 0 0 5	0% 60% 40% 0% 0% 100%	60% 40% 100%
7. I am confident that I will achieve the goals that I set for myself.	Strongly agree Agree Neutral Disagree Strongly disagree Total	0 3 2 0 0 5	0% 60% 40% 0% 0% 100%	60% 40% 100%
8. I believe hard work pays off.	Strongly agree Agree Neutral Disagree Strongly disagree Total	5 0 0 0 0 5	100% 0% 0% 0% 0% 100%	100%
9. I think that no matter who you are, you can significantly change your level of talent.	Strongly agree Agree Neutral Disagree Strongly disagree Total	0 3 2 0 0 5	0% 60% 40% 0% 0% 100%	60% 40% 100%
10. I can change my basic level of ability considerably.	Strongly agree Agree Neutral Disagree Strongly disagree Total	0 3 2 0 0 5	0% 60% 40% 0% 0% 100%	60% 40% 100%

As can be seen in table 4.15, all indicators are about students' self-efficacy. The indicators investigated students' self-confidence of own abilities to learn and to accomplish goals, effort to develop abilities and skills, and to solve difficult problems.

The results indicated that in terms of "the ability to manage to solve, and to solve difficult problems, if they try and invest hard enough" (Q1 and Q2), 60% indicated 'agree' and 40% indicated 'neutral'.

For the indicator of asking “ it is easy for them to stick to their aims and accomplish their goals” (Q3), 40% of them indicated ‘strongly agree’, 20% indicated ‘agree’ and 40% of them indicated ‘neutral’.

Regarding the confidence to figure out anything if they try hard enough, the ability to learn what is being taught in class and, to develop just about any skill if practicing every day, and the confidence to achieve the goals set (Q4,5,6,7), 60% indicated ‘agree’ and 40% indicated ‘neutral’.

When asked about the belief about hard work pays off (Q8), most of them (100%) said that they strongly agreed with the merit of hard work.

Regarding to the ability to adapt themselves and change their level of talent (Q9,10), 60% indicated ‘agree’ and 40% indicated ‘neutral’.

## **2. The result of participants’ self-efficacy analysis using the teacher’s fieldnotes**

The teacher’s fieldnotes were done daily during the study sessions to investigate students’ self-efficacy. It was found that during the first week, most of the students showed low self-efficacy. However, they demonstrated higher self-efficacy during the rest of their study sessions. Five descriptive content domains based on the key selected engagement features were derived and are presented in table 4.16.

**The Table 4.16: Descriptive content domain**

<b>Descriptive content domain</b>	
1.	Social withdraw
2.	Anxiety and emotional turmoil
3.	Inability to accept compliments
4.	Accentuating the negative
5.	Reluctance to trust one’s own opinion

All 5 indicated descriptive content domains can be put into the categories of students’ self-efficacy selected for this study as shown in the table below:



**The Table 4.17: Selected students' self-efficacy features and descriptive content domains**

<b>Selected students' self-efficacy features and descriptive content domains</b>		
<b>Low self-efficacy indicators</b>	<b>The first week</b>	<b>The rest of their study sessions</b>
Social withdraw	Stay alone, no eye-contact, no words, walk way, ignore the teacher, do not want to come to class	Talk and interact a lot more with friends and teacher, speak with some eye contacts, request to have more days of class.
Anxiety and emotional turmoil	Produce bad words, make loud noise, exaggerate, get angry, squint eyes, sit with chin on the table	Produce few bad words, hardly make loud noise, hardly get angry, sit without chin on the table
Inability to accept compliments	Ignore all compliments	Accept all compliments with smiles
Accentuating the negative things	Refuse to study, produce bad words, prefer violent horror and weird movies,	Ask for more class, put more effort and cooperate in the activities, are interested in any other kinds of movies rather than horror movies
Reluctance to trust one's own opinion	Usually say "No", "I don't know", say nothing, show no contribution	Indicate what they like and do not like, negotiated to divide the latest learning material into the smaller chunks, provide the reasons with their suggestions