

CHAPTER 1

Introduction

1.1 Rationale

Presently, learning disability (LD) is seen as one of the most significant constraints that limits the improvement of learning ability in school. This problem not only has an impact on children per se but also on those who are close to them, including their parents, teachers and peers. Learning disorders include the difficulties to speak, to listen, to write, to spell a word, to think, to communicate with others as well as to learn mathematics (Arayawinyu, 2001). Generally, children who are identified with LD tend to have two-year-delayed development in academic skills than their age-level peers (Reungdarganon, 2010). Though there is no annual record of the number of LD incidence in each country, the literatures show that the incidences are prominent among other disabilities in many countries. Recent reports show that there were approximately 2.4 million children with LD in the USA in 2010 (NCLD, 2010), and approximately 115,000 children in Malaysia in 2010 (Hashim, 2010). The latest report show that there were approximately 286,000 children with LD in the UK in 2011 (Emerson et al., 2011). In Thailand, the latest study on children with learning disability was reported that 5 percent of the number of Thai children aged 6-12 years (approximately 777,250) has learning disability (Khaimook, 2014). This information implies that learning disabilities in Thai students has increased and needs attention and understanding in order to implement appropriate interventions to scale down the problem.

LD comes in several forms. Students with LD may demonstrate different forms of deficit depending on many factors. The review literature of LD proposed that LD can be mainly categorized either by 1) type of affected information processing (NICHY, 2004) or 2) specific difficulties caused by a processing deficit (APA, 2000). The current study employs information processing as a criterion to classify LD describing the deficiency of four steps of information processing in learning, including input,

integration, storage, and output that was employed by the National Dissemination Center for Children with Disabilities (NICHY) in the USA (NICHY, 2004). Chapparo (2006) defined information processing as ‘the ability to systemize data, appropriately adjust, and integrate prior data with updated data from new experience. These processes can help facilitate the planning process, reordering the data structure, and finally demonstrating out the target behavior’ (Chapparo, 2006, p.45). An ability to process and respond to information is one of the most significant components for the learning process. An ability to retrieve previous information is very important for learning new subjects. For those who have an ability to effectively store data will be able to easily retrieve them (Terry, 2003). Many researchers have been interested in information processing on children with LD. However, they have focused on different aspects of information processing, and employed different research instruments and methodologies. For example, Watson and Willows (1995) investigated information processing patterns among 50 unsuccessful readers, aged between 6 to 10 years, who had difficulty in interpreting symbolic processing or memory, visual processing deficiencies, and difficulty in both visual processing and rapid automatized naming. Likewise, Cermak (1983) found that information processing strategy in children with LD was impaired relative to that of normal readers. The LD children did not recognize the semantic content of that information as clearly as did normal readers. As a consequence, their storage and ultimately their retrieval of this material on the basis of these characteristics suffered. Jordan and Porath (2006) also reported that these children have perceptual problems, so they did not have an inability to interpret auditory and visual completely or accurately. As a consequence, these children could have difficulty in concentration, visual discrimination, and correlated perception. However, these researches highlighted the same conclusion that information processing disorder was a crucial problem in children with LD.

Assessment is a vital step of an occupational therapy process for implementing an effective intervention. There are two assessment approaches contemporarily employed by occupational therapists; bottom-up and top-down approach (Kolehmainen, 2010). A bottom-up approach commonly targets on measures of isolated components of performance and is usually administered in situations aside from real-life contexts (Stewart, 1999). The specific purpose of this kind of assessment is to identify specific

performance components considered to have a causative relationship to performance capacity (Fawcett, 2002). In contrast, a top-down approach assumes a global perspective focusing on a person's participation during occupation in context (Grieve, 2000). The purpose of such assessment is to identify the occupational tasks the client is able and wants to perform in order to engage with satisfaction in her/his roles and participate in society (Fisher, 2009). In the area of cognitive intervention, there is an increasing need of an occupation-focused assessment tool that supports a top-down approach to identify and to explain how cognitive deficits interfere with daily task accomplishment in clients with cognitive dysfunction including children with LD. In addition, this instrument helps to establish strengths and weaknesses in the cognitive processing strategies that are required to execute these critical activities. Occupation-focused assessment has been recommended by therapists to measure cognitive disorder since it considers real-world situations that could lead to greater individualization of treatment plans and thus to a more efficient therapy outcome (Semkovska et al., 2004). The Perceive, Recall, Plan and Perform (PRPP) System of Task Analysis is one of the occupation-focused assessments that measures both task performance skills and cognitive information processing strategy over time in a specific context (Chapparo & Ranka, 1996).

The PRPP System of Task Analysis is used with adults and children who have difficulty performing daily or episodic tasks. It is appropriate for adults and children of either sex and from any cultural background (Chapparo & Ranka, 1996). It was initially created to meet the needs of occupational therapists working with clients who had sustained a brain injury (Chapparo & Ranka, 1997). Subsequently, many researchers have conducted studies on the PRPP System of Task Analysis that has been used to assess cognitive deficits in a variety of samples such as adults with traumatic brain injury (Fry & O'Brien, 2002; Munkhetvit, 2005; Nott, Chapparo, & Heard, 2008), persons with schizophrenia (Aubin, Chapparo, Gelinas, Stip, & Rainville, 2009), men with HIV-1 Dementia (Ranka, 2010), typical children (Boland, 2004; Fordham, 2001; Stewart, 2010), children with learning disabilities (Chapparo, Lowe, & Heard, 2013; Challita, Chapparo, Hinitt, & Lowe, 2013; Lowe, 2010; Pulis, 2002) and children with autism (Lohri, 2005). As for children with learning disabilities, Lowe (2010) focused on exploration of cognitive strategies that may be critical to successful participation in school occupational performance of students with learning difficulties enrolled in mainstream primary

(elementary) schools in Australia by using the PRPP @SCHOOL-1 (TQ & PQ) which was developed in a part of the study. Aside from the fact that the PRPP System of Task Analysis has been used for assessing information processing strategy, it has also been used as a strategy for intervention as featured in the study by Nott, Chapparo and Heard (2008) on the effective occupational therapy intervention with adults demonstrating agitation during post-traumatic amnesia. The study found that the PRPP of intervention substantially improved the subject's ability to apply information processing study during occupational performance. In Thailand, the PRPP System of Task Analysis was translated into Thai language and had been studied for its reliability and validity by Munkhetvit (2005) as part of her doctoral thesis. After that, the PRPP System: Thai Version has been used in Thai context in clients with stroke, person with schizophrenia, and the elderly with dementia. However, the PRPP System: Thai Version has never been used in Thai children. Therefore, the PRPP System: Thai Version was used to explore information processing strategies application in Thai children with LD in this study. Moreover, this study also investigated the effect of the PRPP of intervention in Thai context. The PRPP of intervention approach aims to improve task performance mastery by addressing the specific cognitive strategy application behaviours identified through the PRPP assessment as most impacting on mastery. Instructional methods used to address these behaviours incorporate cues and prompts that align with specific perceive, recall, plan and perform processing operation and preferences. The efficacy of this approach has been observed in children and adults with a variety of diagnoses and conditions that impact on everyday cognition (Chapparo, 2010), and demonstrated through research with adults with traumatic brain impairment (Nott, Chapparo & Heard, 2008) and children with social and behavioural difficulties (Challita et al., 2013). Not only the PRPP of intervention was used to improve cognitive strategy application behaviours in this study, the researcher also considered the frameworks which could be used to scaffold for organizing the selection and implementation of effective teaching and learning strategies relevant to needs of each child. The four-quadrant model of facilitated learning (4QM) (Greber, Ziviani, & Rodger, 2007) was considered as the suitable framework that could be used together with the PRPP of intervention. The PRPP of intervention and the 4QM are top-down approaches and based on teaching and learning approaches that help stimulate mastery of task and activity to the children's target. The

4QM would be relevant to occupational therapists who regularly facilitate skill acquisition as part their service offering. It has been advanced as one way of informing the selection of effective learning strategies based on the changing needs of the learner when acquiring a new skill. Grouped into four broad clusters (Quadrant 1 - Direct, Facilitator-Initiated Strategies; Quadrant 2-Indirect, Facilitator - Initiated Strategies; Quadrant 3 - Direct, Learner-Initiated Strategies; Quadrant 4 - Indirect, Learner-Initiated Strategies), these strategies provide a scaffold for identifying and attending to a child's various learning needs throughout the skills acquisition process (Greber & Ziviani, 2010).

In addition, low academic achievement as a result from low ability in information processing is not the only major problem found in children. Many researches highlight that social competencies of these children are also crucial. Punyo (2010) stated in her study that children who were identified with LD generally had difficulties in social-emotional development. This problem was a consequence from the continuously unaccomplished learning activities. As a result, they tended to lose their self-esteem, think negatively about themselves, have high anxiety and display a variety of adverse emotional reactions. Because of these reasons, they could easily lose their temper and become depressed. Thus, many psychologists noticed that these disabled children had a higher tendency to be affected by their development of social skills than the academic learning skills (Punyo, 2010). The studies of Haager and Vaughn (1995) and Wight and Chapparo (2008) found that those who were close to children with LD, including, their parents, teachers and peers, believed that these disabled children had relatively lower social competence than their age-level peers (Haager & Vaughn, 1995; Wight & Chapparo, 2008). Furthermore, the study of Kavale and Forness (1996) and Wong (2004) also claimed that children with LD tended to participate less in social activities compared to those of the same age (Kavale & Forness, 1996; Wong, 2004). Chapparo (2010) stated in her study that these disabled children tended to be less accepted, frequently rejected and ignored by peers. As a result, they will would less chance to participate in activities with their friends (Chapparo, 2010a). In summary, children with LD are frequently found with low level of social competence together with the problems of low academic achievement. The issues related to information processing strategy and social competence are seen as significant problems in children with LD. Many researchers have conducted studies on the relationship between ability in information

processing and social competence in psychiatric patients and found that cognitive ability could significantly predict social competence (Penn, Muser, Speulding, Hope, & Reed, 1995; Addington, McCleary, & Munroe-Bulum, 1998; Green, 1996; Dickerson, John, Ringle, Parente, 1996). Many similar studies have been conducted by researchers on children with attention deficit hyperactivity disorder (ADHD) and typical children (Welsh, Parke, Widaman, & O'Neil, 2001; Charm, Carroll, & Strurge, 2001; Joseph, 1994). Nevertheless, there is no study investigating a direct relationship between information processing strategy and social competence on children with LD. As a consequence, the current research also investigated the relationship between information processing and social competence in Thai children with LD.

This research aimed to explore information processing strategies application during daily tasks of Thai children with LD using the PRPP System: Thai Version and investigate the effect of the combination of the PRPP of intervention and the 4 QM in Thai context, and to examine the relationship of information processing and social competence in the samples of Thai children with LD. The researcher expected that after the research had been completed, information obtained from the research served to strengthen occupational therapy knowledge regarding the use of top-down, occupation-focused assessment for measuring cognitive functions and cognitive strategy intervention in children with learning disabilities in Thailand.

1.2 Purposes of the study

- 1) To explore information processing strategy application on Academic and Play activities in Thai children with learning disabilities using the PRPP System: Thai Version
- 2) To examine the relationship between information processing strategy during the Academic activity and social competence in Thai children with learning disabilities
- 3) To investigate the effect of the combination of the PRPP of intervention and the 4 QM of facilitated learning on an ability to apply processing strategies during the Academic activity of Thai children with learning disabilities

1.3 The definitions used in this study

- 1) **Information processing strategy** in this study was defined as the ability to

perceive, recall, plan and perform appropriately based on the assessment of the PRPP System: Thai Version

- 2) **Social competence** in this study was defined as the skills and behaviors necessary for learning and concurred with the Social Competence Scale (Parent and Teacher Version), which consists of three domains: 1) prosocial/communication skills 2) emotion regulation skills, and 3) academic behavior skills.
- 3) **Children with learning disabilities** in this study were defined as the children who have been diagnosed as learning disabilities by the child and adolescent psychiatrist. The age of participant at the commencement of the study was 9 years or above and studying in the order of grade level from Prathom 4 to 6. They had received occupational therapy services from the Rajanagarindra Institute of Child Development Department of Mental Health, Ministry of Public Health, Chiang Mai province and were students in Chiang Mai province.

1.4 The benefits of study

It was expected that after the research had been completed, information obtained from the research served to:

- 1) Strengthen occupational therapy knowledge regarding the use of top-down, occupation-focused assessment for measuring cognitive functions in children with learning disability in Thailand
- 2) Expand occupational therapy knowledge regarding cognitive strategy intervention in children with learning disabilities in Thailand
- 3) Confirm theoretical knowledge about the relationship between information processing strategy and social competence in children with learning disability