CHAPTER 2

LITERATURE REVIEW

This chapter is divided into six sections. The first section presents the definition of learning styles. The second section describes fundamentals of learning styles. The third section describes approaches to learning styles. The fourth section deals with categories of learning styles. The fifth section states learning styles in the classroom. The last section involves related researches.

2.1 Definition of Learning Styles

Learning style is an individual's natural or habitual pattern of acquiring and processing information in learning situations. A core concept is that individuals differ in how they learn (Gardner, 1995). The idea of individualized learning styles originated in the 1970s, and has greatly influenced education.

Learning styles also qualified as cognitive, affective, and psychological behavior which show how learner perceive, interact with, and respond to the learning environment (NASSP 1979). Learning styles can be referred to as "stable, pervasive characteristics of individual, expressed through the interaction of one's behaviors and personality as one approaches a learning task" (Reid 1987). Learning styles are the general approach, for example, global or analytic, auditory or visual, which students use in acquiring a new language or learning any other subject. These styles are "the overall pattern that give general direction to learning behavior" (Cornett 1983, p.9). Elements of learning styles showed in the research literature as early as 1982. That is, Koch (1998) certified that at the beginning of 1950s and 1960s, researchers distinguished learning and teaching theories focusing on each individual learner's learning needs, while in the late 1960s and the early of 1970s. The term 'learning styles' was likely first used by Thelen (1954) in discovering the dynamics of groups at work.

Learning styles are acceptable as various approaches or ways of learning. They involve educating methods, particular to an individual which are presumed to allow that individual to learn best. Most people prefer an identifiable method of interacting with, taking in, and processing stimuli or information. Based on this concept, the idea of individualized "learning styles" originated in the 1970s, and acquired "enormous popularity" (Wikipedia, 2011).

Obviously, learning styles is also the biological and developmentally imposed set of the characteristics which cause the same teaching wonderful for some and terrible for others (Dunn and Griggs 1988, p.3). Learning styles are not dichotomous (black or white, present or absent), but mostly operate on a continuum or on multiple, intersecting continua. For example, a person might be more extroverted than introverted, or more closure-oriented than open, or equally visual and auditory but less kinesthetic and tactile. Few of any people could classified as having all or nothing in any of these categories (Ehrman 1996)

Proponents of the use of learning styles in education recommend that teachers assess the learning styles of their students and adapt their classroom methods to best fit each student's learning style. Although there is ample evidence for differences in individual thinking and ways of processing various types of information, few studies have reliably tested the validity of using learning styles in education. Critics say there is no evidence that identifying an individual student's learning style produces better outcomes. There is evidence of empirical and pedagogical problems related to the use of learning tasks to "correspond to differences in a one-to-one fashion" (Klein, 2003). Well-designed studies contradict the widespread "meshing hypothesis", that a student will learn best if taught in a method deemed appropriate for the student's learning style (Pashler, McDaniel, Rohrer, Bjork, 2008).

Many studies on learning styles began as early as 1892 (Keefe 1987; Keefe & Jenkins 1984). Carbo, Dunn and Dunn (1986) suggested that one of the major developments in the field of education was the research and identification of learning styles. Lemire (2000) pointed out that extensive attention to individual learning styles was a major movement in education for the past 25 years. Jonassen and Grabowski (1993) argued that "An outgrowth of the interest in cognitive styles has been the evolution of

learning styles, which are general tendencies to prefer to process information in different ways" (p. 233). Kolb and Kolb (2003) indicated that learning styles have become a key factor in providing an effective learning experience.

Loo (2002) indicated that learning style is "the consistent way in which a learner responds to or interacts with stimuli in the learning context" (p. 252). Irvine and York (1996) provided a common definition learning styles with three styles such as (a) cognitive, (b) affective, and (c) physiological (p. 6). Dunn and Dunn (1998) defined a learning style as the way each person begins to concentrate on, process, and retain new and arduous information. P.Smith and Dalton (2005) defined a learning style as "the typical way an individual likes to go about learning" (p. 5). They also pointed out that because everyone is different there is possibility of having various different learning styles.

Johnson and Orwig (1998) defined learning style as "the unique collection of individual skills and preferences which effect how a person perceives, gathers, and processes information" (para. 2). Karges-Bone (1998) set learning styles into two modalities; (a) visual-spatial modality enhancers and (b) auditory-language modality enhancers. A partial list of visual-spatial modality enhancers utilizes materials as whiteboard, colored markers, overhead projectors, computer, and workstation with printer. The auditory-language modality enhancers include the classroom library, biography center, books, and tapes. Felder (1996) defined learning styles are the "characteristic strengths and preferences in the ways they take in and process information" (p. 18).

Campbell et al. (1996) defined learning style as "a certain specified pattern of behavior according to which the individual approaches learning experience". Kolb (1984) defined learning style as "the process by which the individual retains new information or new skills". Dunn et al. (1981) defined learning style as "a way in which the individual takes in new information and develops new skills". Zapalska (2007) defined the learning style as "the preference or predisposition of an individual to perceive and process information in particular way or combination of ways" (p. 8).

Cottrell (2001) denoted that learning is a process to assist us to encode information from memory and to transmit information from one part of brain to another and to form associations between new and known materials. Yannnibelli, Godoy and Amandi (2006) stated that "Learning styles encapsulate the preferences of students, regarding how they learn" (p. 55). Briggs (2000) accepted that analyzing learning styles of individuals has always been a debate and investigated frequently in the past. Smith (2002)

supported that it is a general experience for all individual to learn and perceive in a variety of ways. Meanwhile, Krätzig and Arbuthnott (2006) demonstrated that "a person's learning style is hypothesized to be a combination of cognitive, affective, and psychological characteristics that explain how that individual interacts with his or her environment" (p. 238).

2.2 Fundamentals of Learning Styles

It is believed that some fundamental characteristics can be found in learning styles, on which they are based (Reid, 1995, xiii). These are:

1. every person, student and teacher alike, has a learning style and learning strengths and weaknesses;
2. learning styles exist on wide continuums; although they are described as opposites;
3. learning styles are value-neutral; that is, no one style is better than others (although clearly some students with some learning styles function better in a US school system that values some learning styles over others);
4. students must be encouraged to "stretch" their learning styles so that they will be more empowered in a variety of learning situations;
5. often, students' strategies are linked to their learning styles;
6. teachers should allow their students to become aware of their learning strengths and weaknesses.

However, students prefer method of learning depending on the task and situation. A student's learning style is varied, it is not fixed. A student can have several different ways of learning depending on what is being learnt. Learning styles changes tasks. A student's learning style for one task may not be the same for a different task, subject or topic. As a result, learning style has three main aspects:

1. How students perceive information
2. How students process information
3. How students organize and present information

2.3 Approaches to Learning Styles

2.3.1 Cognitive Approach to Learning Styles

Anthony Grasha and Sheryl Reichmann, in 1974, formulated the Grasha-Reichmann Learning Style Scale. It was developed to analyze the attitudes of students and how they approach learning. The test was originally designed for college students. Grasha's background is in cognitive processes and coping techniques. The concepts of various learning styles are as follows:

avoidant, participative, competitive, collaborative, dependent, and independent.The conclusion of this approach was to provide teachers with insight on how to approach instructional plans (Grasha, Anthony, 1996). It also aims to explain why aptitude tests, school grades, and classroom performance often fail to identify real ability.

2.3.2 NASSP Approach to Learning Style

The NASSP (The US National Association of Secondary School Principals) Approach to learning style believes that learning style is a gestalt that tells us how a student learns and prefers to learn. "Learning styles are characteristic cognitive, affective, and physiological behaviors that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment." (Keefe, 1979). There are three broad categories of learning style characteristics:

2.3.2.1 Cognitive styles are preferred ways of perception, organization and retention.

2.3.2.2 Affective styles represent the motivational dimensions of the learning personality; each learner has a personal motivational approach.

2.3.2.3 Physiological styles are traits deriving from a person's gender, health and nutrition, and reaction to school physical surroundings, such as preferences for levels of light, sound, and temperature.

These styles are hypothetical constructs aiming to explain the learning and teaching process. "Because learning is an internal process, it has taken place only when we observe a relatively stable change in learner behavior resulting from what has been experienced. Similarly, learning style reflects underlying learning behavior. We can

recognize the learning style of an individual student only by observing his or her behavior" (Keefe, 1979).

2.4 Categories of Learning Styles

Since learning styles can be referred to as an individual's natural, habitual and preferred way(s) of absorbing, processing, and retaining new information and skills. These learning styles persist, regardless of teaching method and content areas. The learning styles may be divided into three major categories: cognitive learning styles, sensory learning styles and affective/temperament learning styles.

2.4.1 Cognitive Learning Styles

Cognitive Learning Styles may be divided as follows:

2.4.1.1 Field Independent and Field Dependent Learning Styles

Field Independent learner learns more effectively step by step, or sequentially beginning with analyzing facts and proceeding to ideas. However, field dependent learner learns more effectively in context, holistically, intuitively, and is especially sensitive to human relationships and interactions.

2.4.1.2 Analytic and Global Learning Styles

Analytic learner: learns more effectively individually, prefers setting own goals and responds to a sequential, linear, step-by-step presentation of material whereas global learner learns more effectively through concrete experience, and by interactions with other people.

2.4.1.3 Reflective and Impulsive Learning Styles

Reflective learner learns more effectively when she or he has time to consider options before responding while impulsive learner learns more effectively when she or he is able to respond immediately and to take risks (often more fluent language learner).

2.4.1.4 Kolb Experiential Learning Model

Kolb Experiential Learning Model includes four kinds of learners: converger learner, diverger learner, assimilator learner, and accommodator learner.

Converger learner learns more effectively when she or he is able to perceive abstractly and to process actively. Diverger learner learns more effectively when she or he is able to perceive concretely and to process reflectively. Assimilator learner learns more effectively when she or he is able to perceive abstractly and to process reflectively. Accommodator learner learns more effectively when she or he is able to perceive concretely and to process actively.

2.4.2 Sensory Learning Styles

There are many ways to explain Sensory Learning Styles, but one of the well-known Sensory Learning Styles is likely to be in the forms of Perceptual Learning Styles.

Perceptual Learning Styles divided learners into six categories: visual learner, auditory learner, tactile learner, kinesthetic learner, group learner, and individual learner.

Visual learner learns more effectively through the eyes (seeing). Auditory learner learns more effectively through the ear (hearing). Tactile learner learns more effectively through touch (hands-on). Kinesthetic learner learns more effectively through complete body experience. Group learner learns more effectively through working with others learns. Individual learner learns more effectively through working alone (Reid, 1987).

2.4.2 Affective or Temperament Learning Styles

2.4.2.1 Myers-Briggs Type Indicator (MBTI)

Myers-Briggs Type Indicator divided learners into eight categories: extraverted learner, introverted learner, sensing learner, intuition learner, thinking learner, feeling learner, judging learner, perceiving learner

Extraverted learner: learns more effectively through concrete experience, contacts with and relationships with others. Introverted learner learns more effectively in individual, independent learning situations. Sensing learner learns more effectively from reports of observable facts. Intuition learner learns more effectively from meaningful experiences. Thinking learner learns more effectively from impersonal and logical circumstances. Feeling learner learns more effectively from personalized circumstances. Judging learner learns more effectively by reflection, deduction, analysis, and process that involve closure. Perceiving learner learns more effectively through negotiation, feeling, and inductive processes that postpone closure

2.4.2.2 Tolerance of Ambiguity Styles

Tolerance of Ambiguity Styles divided learners into two categories: Ambiguity- Tolerance learner and Ambiguity- intolerance learner.

Ambiguity- Tolerance learner learns more effectively when opportunities for experiment and risk, as well as interaction, are present while ambiguity-intolerance learner learns more effectively when in less flexible, less risky, more structured situations.

2.4.2.3 Right and Left brained Learning Styles

Right and Left brained Learning Styles divided learners into two categories: right-brained learner and left-Brained learner. Right-Brained learner learns more effectively through visual analytic, reflective, self-reliant learning whereas left-Brained learner learns more effectively through auditory, global, impulsive, interactive learning

The scope and depth of learning styles vary because it seems impossible to limit a person's learning style only with a certain dimension, that is, it cannot be said that a person is only visual, audio or kinesthetic. Ehrman and Oxford (1995) assert "Naturally, not everyone fits neatly into one or another of these categories to the exclusion of the other, parallel categories (e.g. visual, auditory, and kinesthetic)" (p. 69). This view is also supported by Willing (1988) who asserts that "At any period in the history of methodological fashions, there is usually the covert assumption of one particular learning style as basic. [However,] what makes the current interest in learning styles new is that several different ways of learning are now held to be equally valid" (p. 6). Kroonenberg (1995) adds another point why there is so much interest in learning styles currently by stating that all students ought to be given extensive opportunities to learn through their preferred style, but "they also need to open the idea of 'style flex' – that is students should be encouraged to diversify their style preferences" (p. 80).

2.5 Learning styles in the classroom

Various researchers believe that learning styles should have an effect on the classroom so they have attempted to hypothesize ways in which learning style theory can be used in the classroom.

Although learning styles will inevitably differ among students in the classroom, two scholars (Dunn, & Dunn, 1978) indicate that teachers should try to make changes in their classroom that will be beneficial to every learning style. Some of these changes include room redesign, and the development of small-group techniques, and the development of Contract Activity Packages.[Redesigning the classroom involves locating dividers that can be used to arrange the room creatively (such as having different learning stations and instructional areas), clearing the floor area, and incorporating student thoughts and ideas into the design of the classroom.

Their so-called "Contract Activity Packages" are educational plans that use: 1) a clear statement of the learning need; 2) multisensory resources (auditory, visual, tactile, kinesthetic); 3) activities through which the newly-mastered information can be used creatively; 4) the sharing of creative projects within small groups; 5) at least three small-group techniques; 6) a pre-test, a self-test, and a post-test.

Other scholar is Sprenger (Sprenger, 2003). She bases her work on three premises: 1) Teachers can be learners, and learners teachers. We are all both. 2) Everyone can learn under the right circumstances. 3) Learning is fun! Make it appealing. She details various ways of teaching, visual, auditory, or tactile/kinesthetic. Methods for visual learners include ensuring that students can see words written, using pictures, and drawing time lines for events. Methods for auditory learners include repeating words aloud, small-group discussion, debates, listening to books on tape, oral reports, and oral interpretation. Methods for tactile/kinesthetic learners include hands-on activities (experiments, etc.), projects, frequent breaks to allow movement, visual aids, role play, and field trips.[By using a variety of teaching methods from each of these categories, teachers cater to different learning styles at once, and improve learning by challenging students to learn in different ways.

James W. Keefe and John M. Jenkins (2000; 2008) have incorporated learning style assessment as a basic component in their "Personalized Instruction" model of schooling. Six basic elements constitute the culture and context of personalized instruction. The cultural components (teacher role, student learning characteristics, and collegial relationships) establish the foundation of personalization and ensure that the school prizes a caring and collaborative environment. The contextual factors—interactivity, flexible scheduling, and authentic assessment—establish the structure of personalization. These six elements constitute the state of the art in personalized instruction.

Cognitive and learning style analysis has a special role in the process of personalizing instruction. Style elements are relatively persistent qualities in the behavior of individual learners. They reflect genetic coding, personality, development, motivation, and environmental adaptation. Second only to the more flexible teacher role, the assessment of student learning style, more than any other element, establishes the foundation for a personalized approach to schooling: for student advisement and placement, for appropriate retraining of student cognitive skills, for adaptive instructional strategy, and for the authentic evaluation of learning. Some learners respond best in instructional environments based on an analysis of their perceptual and environmental style preferences. Most individualized and personalized teaching methods reflect this point of view. Other learners, however, need help to function successfully in any learning environment. If a youngster cannot cope under conventional instruction, enhancing his cognitive skills may make successful achievement possible. Many of the student learning problems that learning style diagnosis attempts to solve relate directly to elements of the human information processing system. Processes such as attention, perception and memory, and operations such as integration and retrieval of information are internal to the system. Any hope for improving student learning necessarily involves an understanding and application of information processing theory. Learning style assessment is an important window to understanding and managing this process.

Some research evaluating teaching styles and learning styles, however, has found that congruent groups have no significant differences in achievement from incongruent groups (Spoon & Schell, 1998). Furthermore, learning style in this study varied by demography, specifically by age, suggesting a change in learning style as one gets older and acquires more experience. While significant age differences did occur, as well as no experimental manipulation of classroom assignment, the findings do call into question the aim of congruent teaching-learning styles in the classroom.

2.5 Related Researches

2.5.1 International Related Researches

Willing (1988) conducted a research with respect to the learning styles in adult migrant education. To serve the purposes of the survey a new questionnaire was developed because the already existing ones had some deficiencies such as having a too narrow focus or being complex in their format and wording. The questionnaire consisted of thirty items on the first page, the second page included fifteen learning strategies, and the third page included items regarding individual biographical results. 517 learners, from over thirty ethnic groups participated the study, but only five of the ethnic groups (Vietnamese, Chinese, Arabic speakers, South Americans, and Polish/Czech speakers) were large enough for statistical analysis.

Regarding the analysis of the results Willing (1988) stated that it was impossible to make "statistically valid cross-comparisons relating a question to more than one biographical variable at a time" (p. 122). For this reason, the individual characteristics of the participants were considered separately. The results indicated that there are cultural differences with respect to the learning style preferences of the learners. Though the mean of the item "I like to study grammar" was lower than expected, all learners from the distinct cultures reflected that they liked studying grammar. However, the Arabic learners were the ones who preferred grammar the most because 65 % of them ranked this item as the "best".

The item related to the use of cassettes at home revealed that the Vietnamese were the only learners who preferred this method. Chinese, in contrast, seemed to "have little confidence in it" (Willing, 1988, p. 130). When the same question was considered with respect to the length of residence in Australia it was revealed that the variation was not big enough to be statistically meaningful. The results with regard to sex indicated that males tend to write everything in their notebooks more than females. Though, moderately both visual and kinesthetic modalities were female preferences.

Reid (1987) conducted a research with respect to the learning style preferences of ESL learners. The overall results of the research indicated that ESL learners

strongly preferred kinesthetic and tactile learning styles when compared to audio and visual. In addition, most groups showed a negative preference for group learning.

The general findings offered by Reid (1987) are as the following:

1. The perceptual learning style preferences of ESL learners differed significantly in several ways from native speakers of English. For instance, native speakers of English were less tactile in their learning style preferences than all non- native speakers and were significantly less kinesthetic than Arabic, Chinese, Korean and Spanish speakers.
2. The learning style preferences of ESL learners from different language, different educational and cultural backgrounds sometimes differed significantly from each other. For instance, the Korean students were found to be the most visual in their learning style preferences. They were significantly more visual than the US and Japanese learners. Japanese learners, on the other hand, appeared to be the least auditory of all learners and were significantly less auditory than Arabic and Chinese learners.
3. When some other factors such as sex, length of time spent in the United States, major field, and level of education were analyzed, the results indicated that there were significant differences in their relationships to various learning style preferences. In the analysis of results with respect to level of education and gender, it was found that graduate students showed a significantly greater preference for visual and tactile learning than the undergraduates. The undergraduates were significantly more auditory oriented than graduates. Both groups strongly preferred kinesthetic and tactile learning. Males preferred visual and tactile learning significantly more often than females.
4. The data obtained from the study also indicated that as ESL learners adapt to the US academic environment, some changes and extensions of learning styles might take place. To illustrate, the longer the students had lived in the United States, the more auditory their preference became. Learners who had been in the US

> more than three years were significantly more auditory in their learning style preference than those who had been in the US for shorter periods of time. This finding indicates that learners adapt their learning style preferences to the learning environment they are involved.

Stebbins (1995, p. 110) replicated Reid's study (Reid, 1987) in order to obtain more information about the similarities and differences in learning styles between ESL learners and Native English Speakers (NESs). He lists the areas in which the results paralleled with Reid's results. Kinesthetic and tactile learning styles were strongly preferred by ESL students when compared to NESs. His comparison were as follows: (1) group learning was again chosen as the least preferred mode by most NESs and ESL students; the only sample group in the current study to indicate a preference for the group learning mode were those ESL students with low (300-349) TOEFL scores. (2) Spanish speakers repeated their strong preference for kinesthetic mode. (3) Arabic and Korean students showed stability in their choice of multiple learning styles. (4) Japanese students again did not strongly identify any style preferences.

2.5.2 Domestic Related Researches

Banbang (2010) investigated 232 undergraduate students consisting of 118 Engineering students and 114 Applied Science students at King Mongkut's University of Technology North Bangkok, Thailand. The results showed that the undergraduate Engineering students preferred visual learning styles as the most preference style while Applied Science undergraduate students preferred kinesthetic learning styles as the most preference style.

Boonsuk (2008) surveyed 433 Pondok schools students in Mattayom Suksa 5 who were learning Endlish as a foreign language in southern Thailand. Most students preferred the group learning styles as their major learning styles. The results also showed that the students from the three school chose individual learning styles as the lowest preference.

Simsek (2005) explored 134 Thai secondary school students of English as a foreign language. Most students preferred kinesthetic style while individual was the negligible learning style.

Singhasiri, Darasawang and Srimavin (2004) studied learning styles 63 first year Achitech student who enrolled in English courses in the first semester (2011) at King Mongkut's University of Technology Thonburi, Thailand. Most students were concrete learners who like to learn in groups through games and pictures. They also like to learn by doing.

Watanasin (2004) studied 20 students who were taking "Business English Oral Communication" course at Chulalongkorn University. It found that students preferred group learning style and nearly preferred visual, auditory and tactile & kinesthetic learning styles.

Buranarek (2002) studied learning styles of 346 certificate vocational education students in Thailand's eastern vocational college. It found that students preferred participant learning styles, dependent learning styles was second priority and the avoidance learning style was the lowest.

Tepsatit (1998) studied learning styles of agricultural students and teaching styles of the instructors in the agriculture and technology colleges within the eastern region group, including the relationship between the students learning styles and the teaching styles that students preferred. The finding revealed that the level of the students learning styles was found to be high in participation, dependent, and collaborative. The teaching styles that instructors used and the students preferred were in between the teacher and students center. There was no significant difference on such learning styles when classified by sex, class and college at the .05 level of confidence, but the relationship was found between the learning and teaching styles that the students preferred.

Nimmanpisut (1992) surveyed 1,181 students at the certificate in vocational education level in colleges under the jurisdiction of the Department of Vocational Education. He found that students used visual, auditory, group and individual learning styles at the moderate level; they used kinesthetic and tactile learning styles at the low level. Students in every major field of study used auditory, group and individual learning styles at the moderate level and used kinesthetic learning style at the low level; the visual and tactile learning styles were used differently by students in each major field

of study at the moderate and low level. Students with different major fields of study used different visual, kinesthetic, tactile, group and individual learning styles.

Sattacomkul (1992) studied 794 students in seven private universities in Thailand. The result showed that private university students favored the participant learning styles the most, collaborative learning style was second priority and the avoidance learning style was the least. It also found that the lower class-level students favored participant learning style while the upper class-level students favored Collaborative learning style. For different areas of study, social sciences students and applied sciences student favored participant learning style while humanities student favored the collaborative learning style. Students with high academic achievement and with lower academic achievement favored participant learning style while students with medium academic achievement favored the collaborative learning style.