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STYLES, STRATEGIES & TASKS: ARE THEY RELATED?

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Abstract

This qualitative study aims at investigating the relationship among cognitive styles, learning strategies and task. In order to determine the dominant cognitive styles of the subjects, questionnaires designed by Kolb (2005) were distributed to 778 engineering students. From the data analysis, it was found that two cognitive styles - 'diverger' and 'assimilator' are the dominant styles. This paper, therefore, focuses on two cases - one is a diverger and the other is an assimilator. The data show how engineering students from different dominant styles dealt with different subtasks, namely, note-taking, writing a story, and oral presentation under a 'Story Telling Competition' task. A stimulated recall interview and a self-reflection form were used as the main research instruments to find out if there is any relationship among the three variables – cognitive styles, learning strategies and tasks. It was found that these three factors are interrelated; i.e. some strategies were used by the two students with different cognitive styles; whereas, some were used differently in order to complete different subtasks. The post-hoc analysis revealed the effect of students' language proficiency on their choice of strategies.

Keywords: cognitive styles, learning strategies, tasks

Introduction

Learners' individual differences such as learning styles, learning strategies, age, gender, and culture are factors that influence the development of language learning. Among those variables, learning styles and learning strategies are variables relating to learners' performance in completing their language tasks. Moreover, learners' learning styles influences their choices of learning strategies (Ehrman & Oxford, 1990).

Learning styles are preferences of behaviors and natural ways of learning unconsciously (Keefe, 1979; Cornett, 1983; Willing, 1993; Reid, 1995). Although some classifications of learning styles were based on different dimensions, such as wholist-analytic and verbaliser-imager, which were proposed on the basis of the ways in which information is processed and represented (Riding & Cheema, 1991; cited in Cassidy, 2004), in second language classroom context learning styles were categorized into three main dimensions: personality, sensory, and cognitive styles (Christison, 2003). Previous studies have investigated learning style preferences influencing different variables such as language background, major field of study, level of education, and achievement in language learning (Reid, 1987; Bailey, Onwuegbuzie, & Daley, 2000; Roberts, 2006; Demirbas & Demirkan, 2007; Li, Chen, Yang and Liu, 2011).

Learning strategies are mental steps or learning processes which are selected consciously to learn a new language or to take actions to improve second language learning (Cohen, 1990; Wenden, 1991). They can also enhance learners' autonomy in language learning (Holec, 1981). Learning strategies have been classified differently, namely, metacognitive, cognitive, and social/ affective strategies (O'Malley and Chamot, 1990), direct and indirect strategies (Oxford, 1990), and cognitive and self-management strategies (Wenden, 1991). Learning strategies have been previously studied with different variables such as language achievement, language skills, and environments while learning (Chamot & Kupper, 1989; Oxford & Park-Oh, 1993; Gao, 2006; Kummin & Rahman, 2010).

Previous studies also investigated how learning styles influenced the use of learning strategies from learners studying at either different levels or in different contexts. For example, Jie and Xiaoqing (2006) investigated the relationship between learning styles, personality styles in particular, and learning strategies used by second-year undergraduates in China. Metallidou and Platsidou (2008) examined the possible relations between learning styles, especially Kolb's theory, and metacognitive knowledge about the frequency of using various problem-solving strategies of pre-service and in-service teachers. Chen (2009) studied the relationship between grade level, sensory styles and learning strategies employed by students in grade seven through nine. Naimie et al (2010) examined the relationship between the strategies used and cognitive styles of English major Iranian female students who are either field dependent (FD) or field independent (FI) learners.

Regarding the investigation between learning strategies and language tasks, several studies were conducted to identify the learning strategies used to complete different language tasks such as note-taking, writing, and oral presentation. For example, Çetingöz (2010) studied the strategies used for note-taking of 10 university students from the Faculty of Education. In relation to writing, Plakans (2009) investigated reading strategies in an integrated reading-writing task of 12 students from two large U.S. universities. Chou (2011) investigated the use and influence of learner strategies in cooperative and individual learning from oral presentations of 52 third year college students majoring in French who were taking a Professional English course.

There have not been many studies exploring the relationship between learning styles and language tasks. For example, Andreou, Andreou, and Vlachos (2008) investigated the relationships between learning styles developed by Kolb (1984) and L2 verbal fluency tasks – phonological, syntactic and semantic tasks – of 452 undergraduate students. Another study conducted by Yuan and Liu (2013) focused on the effects of cognitive styles on information-seeking task

performance between an information visualization system and a generic information system by 32 graduate students.

It was found that only two variables either styles-strategies, tasks-strategies or styles-tasks were investigated in the past. However, we have not seen any study which investigated the intersection of the three variables which are styles, strategies and tasks. Therefore, this study aims at investigating the relationships among cognitive styles, learning strategies and language tasks.

Literature Review

Cognitive styles

Cognitive styles in this study will focus on Kolb's experiential learning theory, which is regarded as a cognitive learning style. It was selected for the present study because the researcher attempted to investigate the learning process of learners that could cover all their possible behaviors when dealing with various language tasks.

Experiential learning theory defines learning as "the process whereby knowledge is created through the transformation of experience." According to Kolb (1984, p.41), "Knowledge results from the combination of grasping and transforming experience". This theory is used to determine a person's learning style and increase their understanding of the process of learning from experience as well as their unique individual approach to learning. The model of this theory also describes two learning modes related to grasping experience – Concrete Experience (CE) and Abstract Conceptualization (AC), and transforming experience – Reflective Observation (RO) and Active Experimentation (AE). It divides the basic learning modes into four types, which are defined as follows:

Concrete Experience (CE) focuses on being involved in experiences and dealing with immediate human situations in a personal way. It emphasizes feeling and is mainly related to learning from specific experiences, and being sensitive to feeling and people.

Reflective Observation (RO) focuses on understanding the meaning of ideas and emphasizes observing. It is mainly related to observing before making judgments, viewing issues from different perspectives, and looking for the meaning of things.

Abstract Conceptualization (AC) focuses on using logic, ideas, and concepts, and emphasizes thinking. It is mainly related to logically analyzing ideas, planning systematically, and acting on an intellectual basis.

Active Experimentation (AE) focuses on two points: actively influencing people and changing situations, and emphasizes practical applications. It is mainly related to learning through doing, including dealing with people and events through action.

(Kolb, 1984)

The four learning modes show a four-stage hypothetical learning cycle, which reveals the preference of each individual for coping with some stages better than others, and that learning is a continuous and interactive process. Moreover, they form two bipolar dimensions of learning, namely, perception (using the bipolar orientations CE-AC) and processing (using the bipolar orientations AE-RO).

The Kolb Learning Styles Inventory (KLSI) is the instrument used to identify the four cognitive styles: diverger, assimilator, converger, and accommodator (see Figure 1).

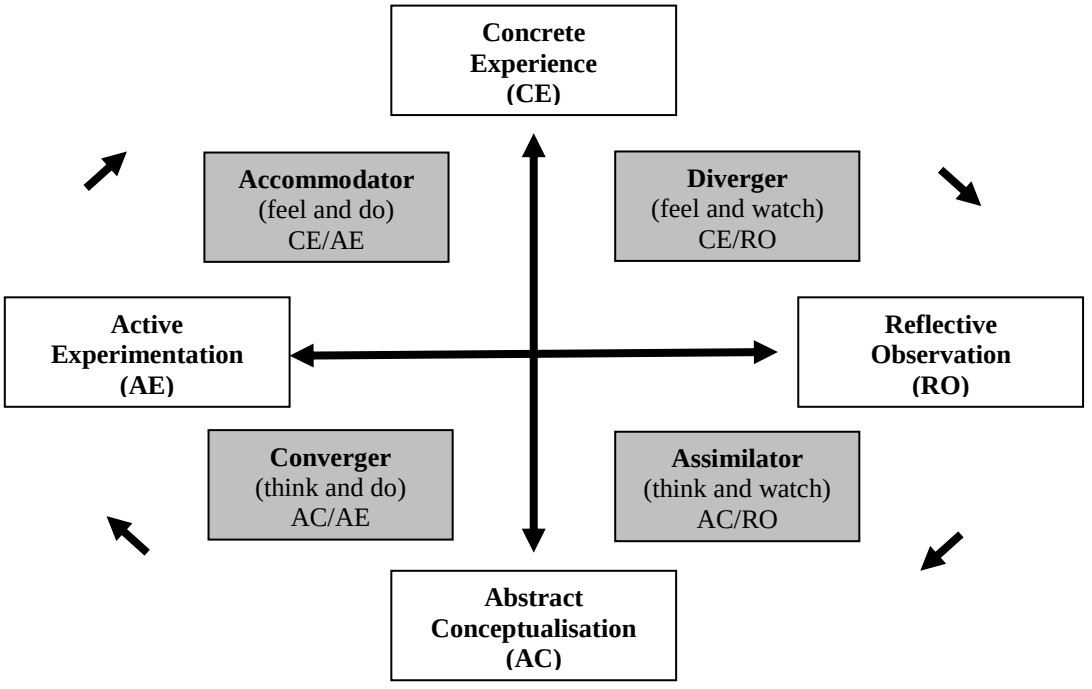

Figure 1: Four learning modes of experiential learning theory

Based on the combination of the learning cycle, the characteristics of the four basic cognitive styles are summarized as follows (Kolb, 1984; Kolb, Boyatzis, & Mainemelis, 2000).

Convergers learn new information abstractly and process it into a concrete solution. They use deductive reasoning to arrive at a single best solution to a question or problem. They are good at solving problems and making decisions.

Accommodators learn new information concretely and transform it actively. They can adapt to changing circumstances and are skillful in doing things, carrying out plans and tasks and getting involved in new experiences. They are more likely to learn and work with others, and feel comfortable in learning through practical experience.

Divergers learn new information through concrete experience and process it through observing. They rely on imaginative ability. They can also generate many alternative ideas and love brainstorming. They are interested in people and are feeling-oriented. However, if they rely on the previous skills too much, they can

become overwhelmed by alternatives and indecisiveness. Therefore, while learning, they prefer working in groups, listening with an open mind and receiving personalized feedback.

Assimilators learn new information abstractly and process different observations into an integrated rational explanation. They are good at inductive reasoning, creating models and theories, including being a systematic planner and a goal setter. However, they should beware of creating 'castles in the air' and avoiding premature discussing of solutions. Therefore, while learning, they prefer readings, lecturing, exploring analytical models, and having time to think things through.

Learning strategies

Learning strategies have been defined with different perspectives such as general tendencies or characteristics of the approach employed by the language learner (Stern, 1983); ideas or behaviors that learners use to enhance their understanding, learning, or retaining of new information (O'Malley and Chamot, 1990); behaviors which are used while learning by learners to approach a new situation so that it is easier, faster, more enjoyable, more self-directed, more effective, and more transferable (Oxford, 1990); and mental steps or operations that learners use to learn a new language and to regulate their efforts to do so (Wenden, 1991).

Learning strategies were also defined by linking to another variable, language task especially. They are regarded as behaviors, steps, or techniques consciously used by students to achieve each task; and also to enhance and to facilitate their own learning (Scarcella & Oxford, 1992, p.63; Chamot, 2004; Chamot, 2005, p.112).

Several classifications of learning strategies which have been proposed suggest that metacognitive strategies involve higher order executive skills, namely, selective attention, planning, monitoring, and evaluation (O'Malley and Chamot, 1990). Also, they are used to control and manage learning (Wenden, 1991). Cognitive strategies refer to direct operation on incoming information (O'Malley and

Chamot, 1990), understanding and producing new language (Oxford, 1990), and mental steps used to process both linguistic and sociolinguistic content (Wenden, 1991). Social/ affective strategies are those used to regulate emotions, motivation, and attitudes; and to interact with others (O'Malley and Chamot, 1990; Oxford, 1990; Cohen, 1996).

However, there has been some controversy about how to define language learning strategies. Educators and researchers agree that strategies are conscious behaviours. Macaro (2006) thinks that as conscious behaviours, strategies thus operate in working memory. Therefore, they may become subconscious to the learners if they repeatedly use them. However, he also proposes that when using a certain strategy, the learners always link them to the goal and a learning situation which is a task; therefore, the use of certain strategies in a new learning situation would be more conscious to the learners because they have to bring them back to working memory and evaluate them against the new situation (Macaro, 2009). In addition to the definition, Macaro also proposes the idea of how to identify size of strategies as there has been a concern of how to put a boundary round a certain strategy. He thinks that using a hierarchy of strategies does not work in every situation because lower components or sub-strategies are not stable. To solve this problem, he proposes that the unit of analysis should be small enough to be achievable and the smaller units can be combined to make a cluster of strategies, which is larger but flexible. Clusters of strategies are used to achieve a learning goal in a specific task or learning situation (Macaro, 2009). His approach shows that strategic behaviour is a dynamic process, not just a taxonomy of the total number of possible strategies that need to be used in a certain task. The learner can modify the chosen strategies to respond to various factors that constitute a certain task such as text difficulty, speed of delivery, prior knowledge of topic and task types (e.g. multiple choice, open-ended question). He also incorporates the concept of language learning where use of language depends on learning that results from a previous task. Learning occurs through modified use in new tasks.

Because learners' choice of strategies is related to the task the learners are doing, they thus orchestrate a combination of strategies, both cognitive and metacognitive, in a cluster of strategies they choose to achieve a certain task.

This study is task-specific in that the researchers attempted to see the relationship among cognitive styles, tasks and strategies; we, therefore, decided to use Macaro's framework to present how the subjects orchestrated strategies to deal with the tasks they encountered by presenting strategies in clusters.

Task

The term 'task' in task-based learning has been defined by several educators as an activity which is related to comprehending, manipulating, producing or interacting with the target language (Nunan, 1989), an activity which uses language to achieve a specific goal (Bachman & Palmer, 1996; Willis, 1996; Bygate, Skehan, & Swain, 2001), or an activity which involves developing the process of learning a language (William & Burden, 1997).

Nunan (2004) distinguished between real-world and pedagogical tasks because the former uses the language in the world beyond the classroom. However, when real-world tasks such as making an airline reservation are transferred to the classroom, the tasks become pedagogical in nature (Long, 1985; Nunan, 2006).

Watson Todd (2001) compiled the characteristics of tasks based on Skehan (1998) and Watson Todd (1999) and proposed that the characteristics of tasks include primary meaning; a communication problem to be solved; a close relationship to the real world; learning as experiential; no pre-specified language points; a large amount of high quality exposure to English; and thematic coherence.

The use of task-based learning may have some relationship between a task and Kolb's experiential learning theory. Nunan (2004, p.12) also thinks that an important conceptual basis for task-based language teaching is experiential learning because this approach

takes the learner's immediate personal experience as the point of departure for the learning experience.

Context of the Study

This study was conducted at King Mongkut's University of Technology Thonburi with 778 second year undergraduate engineering students who were studying the second and third fundamental English courses in the second semester of the 2011 academic year. Firstly, Kolb's questionnaire was used to identify the students' cognitive styles. Then twelve of the subjects from the dominant styles – diverger and assimilator – were selected to complete a task, i.e. 'Story Telling Competition', in order to have insights into how cognitive styles, learning strategies, and tasks are interrelated.

The task consists of three subtasks: *note-taking* – an individual work – where the students had to take notes based on the character they chose; *writing a story* – a group work – where the students had to write a story based on the characters in their notes; and *oral presentation* – a group work – where the students had to perform a role play based on their written story. In order to create the situation to be as realistic and naturalistic as possible, the students were asked to freely separate into groups of three consisting of group members of different cognitive styles before doing the task individually and then collaboratively working with other students in the group.

The study was conducted in a micro-teaching room where hidden cameras were used to record students' behaviors while completing the task.

Methodology

Participants

The dominant styles for the study are diverger and assimilator. The students from the two groups who scored highly (more than 80%) were selected so that their cognitive styles could be reflected while dealing with the task. To ensure that they had enough proficiency to complete the task created, the students who received the grades

between C+ and A from the previous English course were asked to voluntarily be research participants for the study. However, the two participants – one diverger and one assimilator – were selected as two cases for this paper because the researchers would like to see how the representatives of different cognitive styles who worked in the same group accommodate each other while working cooperatively.

The participants in this study were two second-year undergraduate engineering students, one is a diverger (female) receiving a B+ and the other is an assimilator (male) receiving an A from the previous English courses. Their ages were between 19 and 20. They will be called "D" and "A", respectively.

Instruments

Two types of instruments were used for the study: 1) self-reflection form, and 2) stimulated recall interview.

Self-reflection form

It was used for the students to record the process they went through while completing each subtask. The form covered two main parts: steps on completing each subtask, and problems the students encountered while doing the subtask including their solutions. The students were asked to fill in the form in Thai (see example in Appendix A) immediately after completing each subtask. The information obtained was used as an input to help the researcher interview the subjects in depth.

Stimulated recall interview

It was used to gain in-depth information about what the students really did while completing the task. This interview was conducted individually in Thai for around one hour and one to two weeks after they had completed the task. The students were stimulated to talk about the strategies they had used while completing each subtask by showing them the video so that they could see their behaviors and process of their working. A self-reflection form was also used to support the interviews.

After that, the data obtained from the interviews was analyzed by identifying keywords, relating to learning styles and learning strategies to see the use of strategies, and to investigate the

relationships between learning styles and learning strategies in completing different subtasks.

Results and Discussion

D is a diverger, the cognitive style which is the combination of 'concrete experience' – mainly relating to feeling – and 'reflective observation' – mainly relating to observing or watching. Therefore, she tends to be interested in people and feeling-oriented. She also prefers working in groups, listening with an open mind and receiving personalized feedback.

As for A, he is an assimilator, which is the combination of 'reflective observation' – mainly relating to observing or watching – and 'abstract conceptualization' – mainly relating to thinking. Therefore, he is good at inductive reasoning and at being a systematic planner and a goal setter. Additionally, he prefers readings, and having time to think things through.

In order to complete the 'Story Telling Competition' task, the subjects had to complete ten stages for three subtasks. Regarding *Subtask 1, note-taking*, there are three steps: choosing the character to take notes, searching, and taking notes. Brainstorming for the whole story, writing the details for each scene, and writing the dialogue were the next three steps used to achieve *Subtask 2, writing a story*. Lastly, *oral presentation* was completed in the last four steps; that is, preparing a presentation, preparing a PowerPoint presentation (PPT), rehearsing, and performing a role play.

When analyzing the strategies both D and A used in dealing with the three subtasks, namely, note-taking, writing a story, and oral presentation, they each employed 'cluster of strategies' differently as follows:

Subtask 1: Note-taking (individual work)

Note-taking is the first subtask which Diverger (D) and Assimilator (A) had to complete. They had to take notes based on the character they chose; Ogre and Batman, respectively. Then they had to note information of the chosen characters under the four topics consisting of i) the name of the character, ii) his/her characteristics,

iii) his/her special ability, and iv) the reasons for choosing the character. The findings obtained revealed their cluster of strategies used as follows.

Stage 1: Choosing the character to take note	
• Choose the character based on prior knowledge.	**D**
• Set goals.	**A**
Stage 2: Searching the information	
• Find information.	**D & A**
• Choose appropriate resource.	**D & A**
Stage 3: Taking note	
• Choose appropriate keywords.	**D**
• Translate the information into Thai.	**A**
• Note down important information.	**D & A**
• Choose the pattern to take notes based on prior knowledge.	**D & A**
• Check the progress of the work.	**D & A**
• Arrange the information.	**A**
• Assess the quality of the notes.	**D & A**
• Add new information.	**D & A**

From the above table, it can be seen that D and A shared similarity in using strategies. However, A clearly shows his being a systematic planner, and arranging information to complete this subtask. He set goals by previewing the handouts to see how many tasks he had to complete, and then chose the character, Batman, based on the goal set, which was to do the oral presentation successfully and realistically, as he said:

> "…I personally like Batman. I think it is easy to do the role play because it is realistic…"

As a diverger, D chose the character based on her previous information and linked it to the information she was searching for to complete this subtask, as she said:

> "…As for the Ogre, in the past I have done the exhibition about her on 'Sunthorn Phu Day'. I know it better than other characters. That is why I chose it…"

According to the first individual subtask, it was found that mostly both D and A employed similar strategies in order to complete it. That may be from a clear guideline (see example in Appendix B) provided by the researcher and the task required the students to find the information to take note.

Subtask 2: Writing a story (group work)

Writing a story based on the character they chose in subtask 1 was the second subtask which was done in a group. The data obtained while they were working in a group was summarized into three main steps: brainstorming for the whole story, followed by writing the details for each scene which consisted of creating the scene and writing the story for each scene, and writing the dialogue. The cluster of strategies each of them used was summarized as follows:

Stage 1: Brainstorming the whole story	
• Set goals.	**A**
• Work with others.	**D & A**
• Ask questions for clarification.	**D**
• Check the progress of the work.	**A**
• Add new information.	**A**
• Evaluate / reflect the outcome of the strategies he chose to work with the group.	**A**
Stage 2: Writing the details for each scene	
2.1 Create the scene.	
• Plan the content sequence by drawing the scenes with pictures (the same as what is to be done in the role play).	**D & A**
• Work with others to delegate responsibility.	**A**

2.2 Write the story for each scene.	
• Create the story based on prior knowledge.	**D**
• Translate the story into English.	**A**
• Check the progress of the work.	**A**
• Ask questions for clarification.	**A**
• Make ideas simpler.	**D**
Stage 3: Writing the dialogue	
• Add new information.	**D**
• Translate the dialogue into English.	**D & A**
• Check the dialogue after translating.	**A**
• Find information.	**D**
• Evaluate/ reflect the outcome of the strategies he chose to work with the group.	**A**

The subjects' cognitive styles were reflected through their use of strategies. For example, D showed her imagination while creating the story by giving ideas such as wanting Batman to swim; whereas, A revealed his realistic thoughts by giving reasons to disagree with D's idea, as he said:

> "…At that time, D is explaining that she would like Batman to swim across the river but I disagree because Batman should appear with good image like helicopter…I think it is strange. Superman should fly. If Batman has to swim, it is strange…"

Also, D showed her being interested in people and feeling-oriented, as stated in the interview:

> "…I feel anxious and sympathetic with my friends…I have said that I'm so sorry, I am useless…if I'm more excellent with writing in English than this, I may help you to complete this activity more quickly…I feel very sympathetic for my friends a lot…"

For this group work, it is notable that A is still a systematic planner while working with others because he planned, initiated what

to do to accomplish each stage, evaluated the strategies he chose to use with others, and checked the progress of his group's work; whereas D mainly worked with others by giving ideas. In order to succeed in this group work, A's being a systematic planner automatically promoted him to act as the leader, while D's relying on imaginative ability enhanced her enjoyment in creating story for the group.

Subtask 3: Oral presentation — role play (group work)

The last subtask was an oral presentation where the students had to perform a role play based on their written story. There are four main steps that they had to cover: preparing the presentation, preparing the PPT, rehearsing, and performing the role play. The cluster of strategies used was summarized as follows:

Stage 1: Preparing the presentation (working in group)	
• Set goals.	**D & A**
• Work with others to discuss how to prepare the PPT for the role play.	**D & A**
• Delegate the responsibility.	**A**
Stage 2: Preparing the PPT (working in group)	
• Find appropriate pictures.	**D**
• Work cooperatively with others to prepare her group's PPT.	**D**
• Evaluate his group's product.	**A**
• Add new information.	**A**
Stage 3: Rehearsing (working individually)	
• Set goals.	**A**
• Memorize.	**D & A**
• Plan the content sequence.	**D**
• Use prior knowledge to improve his group's PPT.	**A**
Stage 4: Performing the role play (working individually)	
• Reduce anxiety.	**D & A**
• Use gesture to indicate the meaning.	**D**
• Read the script when she forgets the dialogue.	**D**

From the above table, although they were involved in group work, they tended to use different strategies because they played different roles, and their cognitive styles have an influence on the strategies used. For example, A is the leader of the group, so he assigned roles to his friends. He showed his being a systematic planner by setting goals and evaluating his group's product whether their work was accomplished, as stated in the interview:

> "…I ask my friends to prepare the PPT first and give it to me. Then I improve it."

D was assigned to prepare the PPT. The diverger tends to generate many alternative ideas. Therefore, to complete this subtask she chose to search for more information from various resources to create the scene in the PPT, as she said:

> "…On Saturday when I come out of the classroom, I and my friend start to prepare the PPT first. I prepare by choosing the scenes from the Internet for each slide in PPT…"

As a diverger, who is feeling-oriented and imaginative, D decided to switch roles with A to make the presentation amusing, as stated in the interview:

> "I asked A to switch the character with me from being Batman to Ogre…I would like my group's role play to be funny. If the male acts as the female, it would be lovely…"

As for the last subtask – oral presentation – both D and A had to prepare the presentation together at the first stage so that would be the reason for using the same strategies which are setting goals for preparing their role play and discussing how to prepare the PPT for the role play. However, after delegating the responsibility, it was found that D who prefers working in group undertook to prepare the

PPT with another member of the group, whereas A who prefers having time to think things through agreed to evaluate the PPT produced by his friends. Both reported the use of memorizing and reducing anxiety while doing Stage 3 (Rehearsing) and 4 (Performing the role play).

To summarize, in order to complete the note-taking which was an individual work, the use of strategies by both participants (Diverger and Assimilator) was similar. It may come from the requirement of the subtask which made the students work step by step. The students' cognitive styles also played some parts in dealing with taking note such as setting goals and arranging the information by A whose cognitive style relied on being a goal setter and a systematic planner. Regarding group work, social strategies were used very often because both had to brainstorm and negotiate with each other while working cooperatively. However, it was found that A whose cognitive style is good at being a systematic planner and a goal setter still employed metacognitive strategies, especially planning, monitoring, and evaluating his group work. Also, their different process in using the same type of strategy, memorizing strategy in particular, was found. For example, in order to use memorizing strategy for rehearsing their dialogue, D memorized her dialogue line by line, whereas A used keywords to help him remember it. In addition, the data obtained from the post-hoc analysis showed that the students' proficiency was a variable affecting the role of the students. That is because A who has higher English proficiency than others in the same group took action as a leader of the group automatically. While taking the role of leader, his cognitive style which is being a systematic planner influences the strategies used, especially more use of metacognitive strategies such as delegating responsibilities for the members of his group.

Implications

The investigation showed that the use of strategies was varied due to the different types of subtasks which are Note-taking, Writing a story and Oral presentation under the task 'Story Telling Competition'. Some strategies were used by the students from

different cognitive styles; whereas, other strategies were used differently. The fact that students with different styles used the same strategies may come from the shared learning mode of the divergers and the assimilators. Both styles share the quality of Reflective Observation (RO) which is about observing of others carefully and developing observations about their own experience before coming up with the new experience for next time. For example, while writing the story, after using metacognitive strategy to check the progress on the work in order to finish it in time, D observed that her group work had the low progress. Then she analyzed that it may be from her limited proficiency; therefore she offered herself to be mainly responsible for creating the PPT for doing the role play. As for A, after realizing that his role as translator in English, and his friends' role as creator for the story in Thai made the group work slow, he asked his friends to switch the role. Then he monitored the progress on the work and found that the group work was still slow. So he asked his friends to switch the role again in order to continue the work until it finished. The strategies which were used differently may be related to the learning styles as well. For example, D who is a diverger always showed her imaginative ability by using cognitive strategy which is transferring her prior experience in reading Thai novels to assist her creating the story. She also used social strategies such as sharing ideas and asking questions for clarification while creating the story. She employed those strategies because divergers are feeling-oriented and love brainstorming.

At the same time, A, as an assimilator, showed that he is a good systematic planner by using metacognitive strategies such as setting goals and organizing the group work more frequently while working cooperatively with his friends.

Cassidy (2004, p.438) stated that 'whereas the relationship between ability and performance is relatively straightforward, such that performance improves with increased ability, the effects of style on performance are contingent on the nature of the task'. This study also revealed that cognitive styles are related to a task. For example, D who is a diverger showed that she likes dealing with people in a

personal way while working in a group, especially writing a story. She also expressed her enjoyment while sharing ideas with her friends for creating the story, and always showed her concern for her friends while working. As for A who is an assimilator, he demonstrated his being a systematic planner while completing every subtask, such as arranging the information obtained for taking notes; and planning the stages while working in group. Additionally, his cognitive style which is related to using logical ideas and concepts, and emphasizing thinking was reflected by his plan and reasons given when doing the task. For example, when they were writing a story using Batman as a character, his friends suggested the story should have Batman swim. However, he wanted to make the story more logical and realistic so he disagreed and explained that Batman should appear with a good image like a helicopter, and not by swimming across the river.

The results from this study can help a teacher to understand students' cognitive styles and realize how their styles affect their choice of strategies while completing different types of tasks. This process could help teachers design appropriate tasks with an understanding of the students' needs and their process of performing different types of task; and teachers would be able to monitor possible learning strategies employed by the students in completing different types of tasks. The study conducted by Singhasiri et al (2004) supports this idea in that knowing the students' learning styles can be used to improve or develop curriculum and materials to suit the students.

While working together to achieve the task, both D and A demonstrated four components related to cooperative learning: sharing, helping, communicating, and mutual-concern (Johnson and Johnson, 1987). They shared their ideas and helped each other to complete the task although they could not have the same responsibilities due to various factors e.g. unequal proficiency, different learning styles, etc. As for mutual-concern, it was expressed very often by D, a diverger, whose learning style is being interested in people. Therefore, she showed her concern to her friends, especially A, about helping him to complete the 'writing a story' subtask

because she thought that if she had higher proficiency, she might be able to help him to finish it more quickly. A, as an assimilator, also paid attention to communicating by analyzing his strategies used in communicating with his friends to check if they were successful. In order to help students with different cognitive styles to work in a group cooperatively, the teacher should be aware of the four components, namely: sharing, helping, communicating, and mutual-concern; and analyze the students' cognitive styles to understand their learning preferences. Moreover, if teachers learn more about their students, they will be able to intervene in the students' working process and can try to encourage better group dynamics through these four components of cooperative learning.

Conclusion

This study was conducted to find the relationships among cognitive styles, learning strategies and language tasks by focusing on two cases – a diverger and an assimilator. It was found that these three factors are interrelated. The student's level of proficiency was also found to affect the students' choice of strategies after the post-hoc analysis. In order to better participate in group work, students should be trained and learn how to deal and work cooperatively with other people who have different cognitive styles. However, this study has a limitation in that it was a case study of two participants. Thus it is suggested that further investigation, involving more participants from the four types of cognitive styles, could be done to validate the conclusions of this current study.

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Appendix A

แบบฟอร์มการสะท้อนตนเอง

ชื่อ-สกุล: _____**รหัสนักศึกษา**_____

วันที่: _____

กิจกรรมที่ 1 **(งานเดี่ยว: การหาข้อมูลเพื่อจดบันทึก)**

- **อธิบายขั้นตอนการทำงานใน*การหาข้อมูลเพื่อจดบันทึก***

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ท่านมีปัญหาขณะที่ท่านทำงานหรือไม่

❍ ไม่มี

❍ หากมี อธิบายปัญหาที่ท่านพบและวิธีแก้ปัญหาที่ท่านใช้ขณะทำงาน

ลำดับที่	ปัญหา	วิธีแก้ปัญหา

Self-reflection form

Name: _____Student ID_____

Date: _____

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Activity 1 (individual work: searching for note taking)

- **Explain your steps in searching for note taking.**

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Do you have problems while working?

❍ No.

❍ If yes, please explain your problems and solutions.

No	Problems	Solutions

Appendix B

Activity 1

Choosing the character (individual work): 1 hour

Objectives : - Enable students to read for specific information.
- Enable students to take note from the reading passage.

Skills : - Searching
- Reporting orally

Stages : 1) Separate into group of three.

2) Draw lots consisting of three categories of characters, a) *Superhero such as Spiderman, and two characters, b) one from a fairy tale in Thailand such as Sung Thong, and c) the other in other countries such as Snow White,* for receiving your own character.

3) Find more information about the character by searching for more information from the Internet.

4) Take note (either in Thai or English) about the character to describe orally with other members in the group. The notes should include:

a) The name of the character
b) Its characteristics
c) Its special ability
d) The reasons for choosing the character.