

# **The Impact of Thinking Maps Instruction on Tourism and Hotels Students' Reading Comprehension**

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## **Abstract**

The current research aimed primarily to investigate the impact of Thinking Maps instruction on expository texts reading comprehension of Tourism & Hotels EFL sophomore students, Suez Canal University, N = 60 (exper. group = 30, control group = 30).

The experimental / mapping group was explicitly taught expository reading materials using Thinking Maps-based instructional strategy. It comprised 5 Thinking Maps – the circle map, the bubble map, the tree map, the flow map, the multi-flow map - that correspond with and were thought to develop some reading comprehension skills: identifying the main ideas, deriving facts and details, giving characteristics, understanding sequencing, and identifying causes and effects.

Data were collected by two tools administered: Thinking Maps Awareness (TMA) test and Reading Comprehension (RC) test. Having had the data analyzed statistically, results revealed that there were significant mean differences between the mapping group and the non mapping group in favor of the first.

This stresses that Thinking Maps instruction had a positive direct impact on raising the mapping group's awareness of Thinking Maps as well as on developing their reading comprehension. Besides, it had a large effect size on those two aspects.

That strategy makes Thinking Maps instruction more practical for EFL instructors who teach expository texts and thus may contribute to further studies for developing other language skills and some global skills such as study skills, summarization and note-taking skills.

## أثر تدريس خرائط التفكير على الفهم القرائي لدى طلاب كلية السياحة والفنادق

### الملخص

هدف البحث الحالي أساساً إلى دراسة أثر تدريس خرائط التفكير على الفهم القرائي للنصوص التفسيرية في اللغة الإنجليزية كلغة أجنبية لدى طلاب الفرقة الثانية بكلية السياحة والفنادق جامعة قناة السويس . وكان قوام عينة الدراسة 60 طالباً المجموعة التجريبية = 30 ، المجموعة الضابطة = 30 .

وتم تدريس المجموعة التجريبية بعض النصوص التفسيرية بالطريقة المباشرة وباستخدام الاستراتيجية التدريسية القائمة على خرائط التفكير. وشملت الاستراتيجية خمس خرائط هي الخريطة الدائرية ، الخريطة الفقاعية ، الخريطة الشجرية ، خريطة التدفق ، والخريطة متعددة التدفق ، والتي رآها الباحث أنها متوافقة مع وقادرة على تنمية مهارات الفهم القرائي الآتية تعرف الأفكار الرئيسية استخراج الحقائق والتفاصيل عرض الخصائص والسمات فهم عمليات التابع تعرف الأسباب والنتائج.

وتم تجميع البيانات من إجراء أداتين للبحث هما اختبار الوعي بخرائط التفكير واختبار الفهم القرائي. وبعد تحليل البيانات إحصائياً ، أظهرت النتائج وجود فروق ذات دلالة إحصائية بين متوسطات مجموعتي الدراسة في الاختبارات البعدية لصالح المجموعة التجريبية ، مما يؤكد وجود أثر إيجابي مباشر لتدريس خرائط التفكير على تنمية الوعي بها لدى طلاب المجموعة التجريبية وكذلك على تنمية مهاراتهم للفهم القرائي هذا بالإضافة إلى وجود حجم تأثير كبير للاستراتيجية التدريسية القائمة على خرائط التفكير على هذين البعدين.

وهذه الاستراتيجية تجعل من تدريس خرائط التفكير أمراً عملياً أكبر لمعلمي اللغة الإنجليزية كلغة أجنبية الذين يدرسون النصوص التفسيرية ، ويمكن بذلك أن تسهم في وجود دراسات مستقبلية تتعلق بتأثير تدريس خرائط التفكير على تنمية المهارات الأخرى للغة وبعض المهارات الكلية مثل مهارات الاستدعاء ومهارات التلخيص ومهارات تدوين الملاحظات.

# **The Impact of Thinking Maps Instruction on Tourism and Hotels Students' Reading Comprehension**

## **Introduction**

Though reading has sometimes been seen as a receptive, even passive skill within the teaching / learning situation, the status of reading should not be underrated. Reading, in fact, is a skill which demands considerable involvement with the text, active participation on the part of the reader, and a high degree of interaction between reader and writer or between reader and text in much the same way as a dialogue does between speaker and hearer.

Reading - to Manning (2003) – is the foundation of life-long learning, and one must be able to understand what is read and be able to apply newly acquired knowledge to subsequent learning. Again, Manning (ibid) stresses that "reading is elemental for learning; one must be able to master comprehension in order to facilitate knowledge acquisition. Rote teaching methods have proved to be only minimally effective, as students typically do not retain much of what they have read and incorrectly decode the material. This dilemma necessitates that educators change their teaching methods to include strategies that address the development of reading comprehension skills, including retention and retrieval thus helping students become independent learners, (p. 19)." Thus, success in learning depends mainly on appropriate strategy use and so successful learners can develop their reading comprehension by being trained to use effective strategies (Dansereau cited in Ou, 2006). One of those strategies is Thinking Maps.

## **Review of Literature**

**I. Thinking Maps Overview.** In this section, there are some issues relevant to Thinking Maps that need to be discussed: definition of Thinking Maps, Thinking Maps as visual tools and the basic qualities of Thinking Maps.

In David Hyerle's (2004) view, Thinking Maps [as a term] is not a grand theory or model, nor a program of development lessons. It is a language enabling all learners with different learning styles to communicate what and how they are thinking. Through this language, learners convey, negotiate and evolve meanings with others, and within themselves, through visual patterns of thinking. Besides, it is a language for learning different content areas by students across different cultures and languages, and across whole schools for deepening instruction by teachers in classroom, (Hyerle, 2006).

And when Gawith (2006) sees that Thinking Maps as a language for learning stating that, "it is not learning about. It is learning by doing", she might take Hyerle's (2004) view into consideration that is: Thinking Maps become a new language for deepening conversations so that students come together through the maps, facing their own and each other's thinking, "opening the space" for problem solving and transforming the quality of thinking and learning across the whole school.

This is the why that drives Hyerle (op. cit.) to consider Thinking Maps as a well-documented need in classrooms and a central organizing principle for twenty-first century education.

From another perspective, Hyerle (2006) sees Thinking Maps as a transformational language in that information is processed and transformed into new understandings, consequently shaping the future, or in that students - via Thinking Maps - transform information into knowledge or transform verbal elements into visual ones. Such a claim appears to have been deeply rooted in Hyerle's works. In his *Student Successes with Thinking Maps*, he asserts that Thinking Maps is a real meta-language, "for learning an interrelated set of thinking patterns for communicating and synthesizing our thinking from across other languages such as alphabets, numerical systems, scientific symbols, musical notation, software programs, international sign language and Braille, for all of these languages have a foundation of fundamental cognitive structures such as sequencing, categorizing, comparing, etc., (2004: p. 5)." This means that through Thinking Maps, learners convey, negotiate and evolve meanings with others and within themselves through visual patterns of thinking.

In other researchers' view (e.g. Matt-Kawryga, 2001; Spiegel, 2000 & Western Region Education Service, 2007), Thinking Maps is an instructional strategy that can help teachers differentiate for English language learners, students of all ability levels and all learning styles in different content areas.

As to teaching reading as a language skill, many schools across many different states, including Texas, North Carolina, Florida, and Mississippi used Thinking Maps for such a purpose. Also other cases can be reported: Mt. Airy Elementary school of Maryland State (DePinto - Piercy, 2006); New Zealand (Hubble, 2006); Catawa County School in Brookline (Hester et al., 1996); Auckland (Hyerle, 2000).

By attending to Harding's call (cited in Buxton, 2009: p. 3): "The human mind is not, but a picture gallery", we can further understand Hyerle's (2000) thought, with the wealth of information available in so many forms, we need to refine and may be redefine what we call a "text". We need new tools that support the interpretation of information that comes to our students in different forms, (p. 103)." In response to processing information verbally and visually, and seeing relationships and patterns in the human mind as a picture gallery, there must be visual tools corresponding with thinking processes. For this, David Hyerle (1993) introduced Thinking Maps as tools for multiple modes of understanding.

Out of the 400 graphic organizers in the world, Hyerle (2004) graphically represented and illustrated eight Thinking Maps based on eight thinking processes taking place in the mind (of six fundamental patterns of thinking). Thinking Maps as tools are "used together as a set of tools for showing relationships, (Thinking Foundation, 2008), increase comprehension (Morgan, 2001), " and provide direction for thinking (Bannigan, 2009)." In so doing, students practice the habits of mind referred to by Costa and Kallick (cited in Bannigan, 2009).

As visual tools, Thinking Maps not only represent cognitive strategies (e.g. Holzman, 2004; Hyerle, 2000; Spiegel, 2000), but also are the cognitive bridge to literacy (Hyerle, 2008). Hyerle elaborates such a view stating that "students are better able to make sense of a selection when they consciously identify the text structure or pattern of thinking developed by the author. When students can consciously identify the thinking pattern and map it out (either in their head or on paper), they are then able to remember, analyze, and synthesize information into meaningful understandings, (p. 5)." That notion is nearly expressed by Ball

(1998) but in different words. He sees that "as students use graphics in net-working information and constructing knowledge, they are empowered to shift from passive to interactive learning (p.77)." This is because Thinking Maps - in his view – is based on a metaphor of connectivism proposing a new paradigm of knowing/ thinking which synthesizes personal experiences of individuals within interpersonal and social connections in construction of new knowledge (op. cit)."

In order to understand what Thinking Maps definitely refer to, it may be useful to note down Turner's view (cited in Freiberg and Driscoll, 2000) concerning the term "Thinking Skills" which refers to " all of the mental processes individuals use to obtain, make sense of, and retain information, as well as how they process and use that information as a basis for solving problems (p. 14)." And these mental processes must be patterned to do the job required, because "as human beings, we think in patterns. We also have some common patterns, for thinking such as categorizing (organizing), sequencing (steps), cause-effect (causes) and spatial reasoning (parts). Those and other patterns all work together when we are learning, (Hyerle, 2000). "

On a global level, Thinking Maps may be defined as synthesizing many of the best qualities of other types of visual tools: an evaluation from the generative quality of mind mapping brain-storming webs, the organizing structure of graphic organizers, and the deep cognitive processing (thinking process tools) found in concept maps.

From the procedural stand point, Thinking Maps are a common visual language for learning - and not for getting that they are a tool set for supporting effective instructional practice. They have a consistent design, but are highly flexible. Each map corresponds with a thinking pattern and is based on a thinking process. With consistent use, the brain develops a pattern that connects the process to a specific thinking map. Besides, each map can be identified by asking guiding key questions, and qualified by using key words and phrases. A template of Thinking Maps overview showing the issues raised in addition to how to design each thinking map is enclosed in Appendix (1).

Something important to add when designing Thinking Maps is to draw large squares around each map. Such squares are known as *Frames of Reference*. They, according to Hyerle and Yeager (cited in Hickie, 2006: p. 50) "assist learners in focusing on how they know knowledge and information. Thinking is guided by frames one's extended cultural and personal experiences, values, and belief systems. Frames of references influence thinking, feelings, and judgments. The frame of reference is used to identify prior knowledge in order to connect to personal experiences, to identify sources from where information comes, to assess and take measure of quality of the source, to analyze an issue or topic from different perspectives, and to identify the purpose for gathering the content."

Finally, whatever Thinking Maps are: language, a learning strategy or an instructional strategy,"they must be completely integrated into the ongoing curriculum, and used as a tool to teach, enhance, extend, and help integrate the curriculum across subject areas, (Hester, 1996: p. 12) ."

## **II. Areas of Research Related to Thinking Maps**

One of the distinct characteristics of Thinking Maps as a language is the theoretical breadth, (Hyerle, 1993). To Hyerle (2004), Thinking Maps integrate research on best

practices, brain research, and a range of other models such as habits of mind, multiple intelligences, and learning styles. But to the researcher, Thinking Maps are thought to have many different theoretical foundations that examine the relationship between Thinking Maps and reading comprehension, the focus of the current study.

According to **schema theory**, the correspondence between a reader's underlying knowledge structures (schemata) and textual material determines the extent of comprehension. Thus, schemata are always organized meaningfully because they - to Suzuki's (2009) view - are claimed to be the basic units of human knowledge. And without a change in schema structure, new concepts cannot be organized. On the other hand, when an intellectual skill is learned, the basic structure of the schema surrounding that skill is formulated. When learning Thinking Maps takes place in a structured situation, a more structured schema, which includes more intellectual skills becomes, consequently enabling the learner to transfer the structure to formulate another schema when needed." The more structured a schema becomes, the more useful it is for further learning, (Suzuki, 2009: p. 3)."

In the area of **cognitive science**, David Hyerle synthesized the research on cognitive skills development by identifying eight fundamental skills and describing how these skills work in unison. By clearly defining these cognitive skills, students quickly become aware of the thinking skills that drive their learning, giving them explicit pathways for thinking about thinking and improving their performance. Hyerle (2007) claims that by linking each thinking skill to a unique and dynamic visual representation, the language of Thinking Maps becomes a tool set for supporting effective instructional practice and improving student performance.

If the cognitive theory explains how concepts in texts are encoded into thinking maps/ visual representations and retrieved from memory, the constructivist theories of cognition and learning generally assume that the knowledge human beings possess does not exist in a perfect form outside human existence. Instead, knowledge is seen as the result of human beings interacting actively with their world. Constructivist theory - according to Eloff & Ebersohn (2004) - "assumes that people are actively involving in constructing knowledge and that such knowledge is always constructed within a particular social and cultural context, (p. 57)."

The third theoretical base of Thinking Maps assumes to be the **meta-cognitive theory** in that "when students and teachers reflect on their work, they become more adept at describing the skills and strategies they use to solve complex problems, and apply those same strategies in a variety of contexts, they consequently discover their meta-cognitive process for both teaching and learning, (Spiegel, 2000: p. 45)." Again, the meta-cognitive theory strengthens thinking in that it refers to one's understanding of any cognitive process - when using Thinking Maps - using skills which involve planning, checking and evaluating as one reads. Furthermore, meta-cognition reflects the ability of students to apply their identified thinking strategies to other contexts particularly real life situations, (Spiegel, 2000: p. 49)."

Moreover, Thinking Maps appear to be in accordance with the **cognitive apprenticeship** - the instructional model proposed by Collins et al. (cited in Abdel-Haq (2008). Cognitive apprenticeship in Collins et al. (op. cit.) belief - is based on guided-

experience and focuses on cognitive and meta-cognitive skills. Using such a model, teachers or coaches promote learning, first by making explicit their tacit knowledge or by modeling their strategies for students in an authentic activity. Then teachers support students' attempts at doing the task. And finally, they empower the students to continue independently. Abdel-Haq (2008: p. 5) states that "we can benefit from cognitive apprenticeship when faced with the difficulties of teaching complex, cognitive skills as reading comprehension ... Not only does cognitive apprenticeship lead to students' greater understanding of the material, it also combats "inter-knowledge," helping them to apply their knowledge and skills in novel situations." Besides, cognitive apprenticeship can be used to help students understand the processes involved in learning. To Collins et al. (cited in Abdel-Haq, 2008), the cognitive apprenticeship focuses on the active involvement of students in the instructional process and on the development of meta-cognition. And because of situating students in and exposing them to a cognitive apprenticeship context similar to that in which experts actually practice, students may be encouraged to have greater levels of knowledge retention and transfer and their higher order reasoning might be facilitating. And departing from the assumption that cognitive apprenticeship practices are motivating and engaging for learners, and encourage authentic activity and assessment, this provides practical steps to apply cognitive apprenticeship as a theory of the process when a master of a skill teaches that skill to an apprentice, (Wikipedia, 2008). Quiet similar steps of such an instructional model - cognitive apprenticeship - go in compromise with that of Thinking Maps.

**Information processing theory** seems also to be deeply rooted in Thinking Maps. Studies and experiments tackled information processing (e.g. Anderson, 2000; Eloff, 2004; Miyake, 2005; Singer, 1990; Weigand, 2006; Willis et al., 2008) demonstrate that deep processing of information (i.e., linking it to more networks of knowledge or schemas in the brain) increase its recall and improve memory. When readers – for example – read to learn, to solve a problem, or to summarize with the help of Thinking Maps, the levels of processes are influenced consequently by such acts helping the process of converting perceptual information to conceptual information involving maps to take place.

The **brain-research** is another area of research that is related to Thinking Maps. According to Leary (cited in Hickie, 2006), one instructional strategy that links the gap between brain-based research and the classroom is the graphic organizer. Many researchers (e.g. Bannigan, 2009; Hyerle, 2007; Marzano cited in Hickie, 2006) stress that the brain works through patterns. These patterns refer to the brain's ability to recognize distinctive sequences of events and networks of relationships. This means that we can remember more if ideas are linked together or chunked physically to be added to the visual element of the brain and engaged with other parts of the brain and consequently moving the concept from short term memory into long-term memory.

In order to verify that brain research supports Thinking Maps, Pat Wolfe (cited in Hyerle, 2008) states: "Neuroscientists tell us that the brain organizes information in networks and maps. What better way to teach students think about ideas and organize and express their ideas than to use the same method than the brain does. Thinking Maps is what the brain does, (p. 4)." This emphasis is also reported by Eric Jensen - a noted authority in the field of brain research as it relates to education. He advised that we [educators] take advantage of this enormous capacity to learn visually. He wrote: "over 90% of all information that comes to our brain is visual (through our eyes). The retina accounts for



40% of all nerve fibers connected to the brain. Our eyes can register 36.000 visual messages per hour, (Jensen, 1996: p. 55)." It would seem that we are all visual learners.

For Thinking Maps, **the dual coding theory** provides strong foundational justifications. The dual coding theory as a theory of memory and cognition developed by Paivo (1991), proposes that cognition involves the activity of two separate mental subsystems: the verbal subsystem which deals with linguistic information and the visual, nonverbal subsystem which specializes in the representation and processing of information concerning images, it suggests that mental imagery is an important component in the process of comprehension in reading. Imagery is said to occur "as a spontaneous, consistent, and natural process during reading (Sadoski & Paivo, 1994: p. 591), regardless of the nature of the text or individual differences among learners. Hendson (cited in Hickie, 2006) explains the dual coding theory of information storage. He states that knowledge is stored in two forms: the linguistic form, and the non linguistic or "imagery" form ... .The non linguistic or "imagery" form involves mental pictures and the physical sensations. This form of information storage results when non linguistic representations stimulate and increase activity in the brain. Many activities produce imagery representations that can be divided into specific behaviors definitely stated by Marzano (cited in Hickie, 2006: P.44) as follows:

- \* asking students to generate mental images representing content.
- \* asking students to draw pictures, or pictographs representing content.
- \* asking students to construct graphic organizers representing content.
- \* asking students to act out content.
- \* asking students to make physical models of content, and
- \* asking students to make revisions in their mental images, pictures, pictographs, graphic organizers, and physical models.

Two more areas of research related to Thinking Maps are the **transformational learning theory** and the **involvement load hypothesis**. According to the first area of research, the student must be a willing participant, ready to engage in the learning process. The teacher can create the atmosphere in the classroom, but the student must not be receptive. Transformational learning - in Wolfe's (2009) view - causes a change in thinking after digesting information. The student must make the connections within himself to create this new awareness. Knowledge then becomes a part of the student as he begins to make new associations and own it for himself. In short, transformational learning requires that the students have a vested interest in their own learning process, rather than being "spoon fed" a bunch of information to memorize or accept. Moreover, when learners use Thinking Maps, they have three options to be transformative. They may transform information into knowledge. Or they may transform using such a visual language from one content area to another. Or they might transform such a learning tool from one learning situation system to another.

When Thinking Maps are implemented in an entire learning community to ensure that students and teachers have a common language for communicating thinking processes, teachers might feel intrinsically satisfied while students might feel involved in the learning process. In the involvement load hypothesis, "involvement is perceived as a motivational – cognitive construct which can explain and predict learners' success in the retention of unfamiliar words", (Laufer & Hulstijn, 2001: p. 14)."For them, the construct of involvement consists of three basic components: need, search, and evaluation. Need is related to motivation especially the intrinsic type or the self imposed by the learner, thus the degree of need is strong. Search and evaluation are related to information processing in cognition. In

the case of the Thinking Maps tasks, if students are asked to read a passage and fill in the Thinking Maps, the task induces moderate need. When working on the Thinking Map task, students will need to refer back to the text a few times to check their understanding and search for information they need, therefore, it induces a strong search. In addition, students will need to compare different ideas presented in the text, sort out their relationships and find out which idea fits the context provided in the Thinking Map, so it also induces a strong evaluation.

### **III. Why Use Thinking Maps?**

When Hyerle first introduced the eight Thinking Maps as a common visual transformational dynamic language for thinking and learning across whole language communities, he has been defending them as they ultimately unite a school faculty around well documented need in classrooms and a central organizing principle for twenty first century education. When applying Thinking Maps program in North Carolina, Hester et al. (1996) have held the belief that that program has had several advantages over other thinking skills programs. They include the following:

1. They provide a concrete and visual method for learning basic thinking skills.
2. They are a successfully organizational tool for students because they force the organization of content material into thinking skill patterns.
3. They also emphasize curricular integration which brings content together in significant connections and aids student understanding.
4. Finally, as Thinking Maps are used, they can be placed in student portfolios for easy assessment. (p.14).

Although many researchers (e.g. Ball, 1998; Blaunt, 2000; Frieberg & Driscoll, 2000; Holzman, 2004; Morgan, 2001) over-emphasize Thinking Maps for students rather than for teachers, David Hyerle (2004) stresses that Thinking Maps have an impact on teacher instruction and student performance. However, the literature related to the impact of Thinking Maps on students as well as teachers will be reviewed followed by their impact on learners and then concluded by their impact on teachers.

One of the greatest concerns in schools today in Hyerle's view (2004) is how teachers can bring together curriculum and instruction in a way that is meaningful for student learning, while focusing on content standards and assessments. "Thinking Maps does the job integrating teaching, learning and assessment (p. 14)." Thinking Maps provide opportunities for students and teachers to talk about thinking and to work together to integrate their discoveries within the context of varied topics, (Speigel, 2000: p.50). For the various views are not few, some of them are to be noted down:

- \* When using Thinking Maps, students and teachers become self-reflective, looking into their own thinking, and become self-regulated learners, (Hyerle, 2004: p. 15; Hyerle in Buxton, 2009: p.5).
- \* Thinking Maps give all students and teachers a common language for meaningfulness, (Danville Public School District, 2007).
- \* Thinking Maps are tools for all learners - students and teachers alike – to "read" and reflect on their own minds and thus become self assessing, (Hyerle, 2000: p. 105).
- \* Thinking maps represent the common visual language teachers and students use to generate and organize ideas, to reflect on sequences of events, to characterize and

contrast strong elements as well as to identify causes and effects of such varied topics, Spiegel (2000, p. 50).

Besides, "Thinking Maps is used at every level of Bloom's taxonomy. We want students to organize and synthesize information in order to transform it into knowledge that they can evaluate from differing frames of reference. We want to engage students in deeply considering how their own frames of reference influence their perceptions, (Hyerle, 2008)."

As for students, Thinking Maps are tools ...

1. to mindfully "read" and interpret information, (Hyerle, 2000, p. 105).
2. to empower students to shift from passive to interactive learning ,(Ball, 1998: p.77).
- 3 to develop students' higher order thinking skills because they complement and promote the eight thinking processes, (Manning, 2003: p. 15).
4. with the consistency of each, for promoting student centered and cooperative learning, concept development, critical thinking, creativity, clarity of communication, and continuous cognitive development, (Danville public School District, 2007); Thinking Foundation, 2008).
5. to help students develop a dynamic view of symbols ... symbol literacy - through which they must actively remake and interpret things in context using symbols. (Hyerle, 2000: p.18).
6. for helping students construct, communicate and create meaning from text, (Jackson, 2003; Manning, 2003).
7. that create a visual approach to help students organize their thoughts and expand ideas and retain information ... [and] are used to decode and evaluate information, (Blount, 2000: p. 1).
- 8 that mediate students' thinking, learning, and meta-cognitive behaviors, (Hyerle, 2004).
9. to help students transfer thinking processes and integrate their learning (Holzman, 2004).
10. help students to flexibly pattern information in order to construct understandings, (Hyerle, 2004: p. 12).
- 11.that increase retention of content knowledge when reading and a deeper understanding of concepts (Hallett et al., 2008; Holzman, 2004; Hyerle, 2000; Morgan, 2001).
12. to help students in community-based learning in that students transform their roles as a learning community by joining as partners in the instructional process, (Spiegel, 2000; Hyerle, 2000).

Some other researchers take quite different directions stressing the reasons behind teaching Thinking Maps in schools as for students. Holzman (2004) -. for example - sees that students can become aware of the types of thinking they can apply to a text / assignment, learn ways to organize information in a manner that makes sense to them, have control over the way they want to think about, demonstrate their thinking easily, and have a strategy to determine the way the author is presenting information. McTighe & Layman (cited in Freiberg & Driscoll (2000) found mapping successful in improving learner retention of information. Their findings also yielded guidelines for the use of the process:

1. *Aid memory by giving tangible cues*, allowing students to focus more quickly on a topic of problem, and providing a visual representation of concepts.
2. *Provide a frame of reference* by offering common terminology and specific cues for action.
3. *Provide an incentive to act* by having students write out their thoughts, allowing teachers to see the results of the thought processes.
4. *Create permanence by imprinting in the mind* a variety of mapping options for transfer to other situations (pp. 315-316).

Stahl Vancil (op. cit.) added a fifth guideline that is "to promote relationships between ideas and information by questioning and discussion during mapping, (p. 316)."

Thinking Maps - in Eloff & Ebersohn (2004) - seem to make balance between identifying the internal cognitive processes and the observable behaviors of students using Thinking Map. This is because Thinking Maps help students process and then understand the different types of knowledge: (declarative, procedural and conditional). The declarative aspect requires that students know what they do when they learn, what kinds of behaviors they engage in that enhance or impede their learning, what learning conditions suit them best and so on. The procedural aspect requires students to be able to understand the topic. The conditional aspect requires them to be aware of when they may need to control their thinking and learning. Consequently, self-regulated learning takes place in that students' learning is not about receiving information passively, but about being able to control and direct their own learning.

Departing from the fact that the nature of thinking is abstract, and during the self-regulation process students are engaging in, Thinking Maps are used to construct, record and display the thinking processes going on inside the students' minds in order to remove the abstract nature of thinking. Buxton (2009: p. 4) describes such a process stating: "when students struggle with thinking, they are, in fact, struggling with the abstract, private and invisible nature of those thought objects. Visual thinking tools, therefore, bring the thoughts into the public, concrete realm making them visible both to the thinker, and to his or her teachers and peers."

By accepting that Thinking Maps is an instructional strategy, or as a tool used in instructional contexts, there must be reasons behind such a strategy or a tool. Generally, Thinking Maps - in Holzman's belief (2004) - can be effectively used to support higher level thinking skills as well as low student achievement. And from a practical point of view, Holzman (op. cit) claims that teachers discovered it is easy to teach the standards using Thinking Maps. But to Spiegel (2000), Thinking Maps improve instructional competencies, and are effective for communication. And for Hyerle (2006), Thinking Maps are used for deepening instruction by teachers in classrooms and for raising the quality of professional development. Besides, Thinking Maps are tools for teachers to "read" their students' minds by the maps that they create.

Not only are Thinking Maps effective in instruction, but they are also useful in assessing students' minds / understanding (Gallagher cited in Holzman, 2004), or at least exploring new formats for assessment, Spiegel, 2000) by depicting how students think and make sense about what they are learning. And over any course of instruction using Thinking Maps, Holzman (2004) concludes - from an administrator's point of view - using Thinking Maps as a tool for assessment. He believes that Thinking Maps make it easy to assess the following: student learning, the content being taught, whether student-centered learning is taking place, the kinds/ levels of thinking being taught, and whether differentiation is occurring.

#### **IV. Thinking Maps and Reading Comprehension**

It is widely known that comprehension is a mental process. It is not found on the printed page, but in the mind of the reader who reads the words on that page. Therefore, reading comprehension - as Adams (cited in Howell & Nolet, 2000: p. 203) states - "is an interactive process through which the reader uses codes, context, analysis, prior knowledge, vocabulary, and language along with executive-control strategies, to understand text." By

this, it is a multidimensional construct, and, as such, not easily observed. Readers, then, must be taught a number of specific skills to aid them in comprehension. In Badrawi's belief (1992), "they must learn how to read for the main idea, for details, for the recognition of content; they need to be able to skim, to read critically, to outline, to use the dictionary, and to vary their reading rate accordingly,(p. 7)." Thinking Maps - seem to have something to do with such a dilemma. Rittschof et al. (cited in Weigand, 2006) stress that increasing attention has recently been paid to the relation between maps and written text in learning. Learners appear to be supported in their ability to make inferences about information when map and text are used in combination. Reading with the appropriate graphic structure can help students select and find important ideas and details as well as detect missing information and unexplained relationships, Hunter et al. (cited in Matt-Kawryga, 2001: pp. 3-4). And if activating prior knowledge is critical to the success of obtaining meaning from the text, and learners relate new knowledge to what they already know, thus assimilating the new information, Thinking Maps appear – then - to encourage the organization of ideas, words, and concepts, and assist in making meaningful patterns and connections, and facilitate comprehension and retention of new text.

But how much the reader comprehends depends on how far he can identify text structures, because "skills in discerning and using text structures (the way reading material is organized) are important to understanding texts," (Gersten & Baker, 1999: p. 2). The same notion has been supported by other researches (e.g. Correll, 1992; Goh, 1990; Martinez, 2002). They claim that text structure awareness has been found to consistently facilitate reading comprehension and recall of text information.

In fact, all texts have discourse structures above the level of the sentence, and most texts are a combination of multiple text structures, often nested one within another. Text structures are "knowledge structures or basic rhetorical patterns in texts, (Grabe, 2003: p. 1), " the organization of ideas in text (Tayler, 1992: p. 221), " or the way in which " the ideas of a text are interrelated to convey a message to the reader." For Grabe (2003), the most commonly used text structures in expository texts are cause and effect, problem solution, comparison and contrast, classification, definition, process, argument-reasoning, time sequence, and description. These text structures recur regularly across texts and in various combinations. This means that each type of expository text structure is represented by a different organizational pattern or a map and presents information in a different way.

The key point in developing Thinking Maps reflecting text structures is simplicity. Thinking maps need to be as clear and direct and teachable as possible. And the activities required to improve students' reading comprehension - in Badrawi's (1992) view - must be purposeful, must relate to the students' experiences and interests, and require some degree of reasoning or the testing of ideas.

Concerning the relationship between Thinking Maps and reading comprehension, many researchers report that Thinking Maps instruction improved reading comprehension.

1. Ball (1998) found significant differences at the 0.01 level for the five subtests out of which was reading comprehension. The mapping group outperformed the no mapping group on each of the five variables applied to college students using the Stanford Diagnostic Reading Test as the evaluating instrument.

2. Gerston & Baker (1999) reported that successful reading comprehension is correlated with oral reading fluency and vocabulary knowledge.
3. Hester et al. (1996) reported that teaching Thinking Maps could help students in Catawba County Schools who experienced difficulty in comprehension or connecting meaning to the words they read. Among the comprehension skills developed were hypothesizing, predicting, generalizing, drawing conclusions, and analyzing relevant and irrelevant ideas and data.
4. Hickie (2006) asserted that graphic organizers aided students in organizing information from expository texts and in comprehension of content area.
5. Hyrele (2009) reported a selected list of school results from several states around the USA that were directly related to the use of Thinking Maps by students. Some of them that showed significant growth in reading are as follows:
  - \* In Margaret Fain School (City schools, Georgia,) reading scores rose from 29% to 69% in 1996.
  - \* In Windemere School (West Orange County, Florida) for two years reading, reading scores levels were at 68% and rose to 80% after the implementation of Thinking Maps in 1997.
  - \* In Carl Waitz (Mission, Texas), reading rose from 62.7% to 88.2% in 1994.
  - \* In Burnswick County Schools (North Carolina), where Thinking Maps began in 1996, two years of test scores show that there was significant growth in reading.
  - \* In A.T. Allen School (Cabarras County, North Carolina), reading rose from 77% to 89% in 1998.

6. Idol (1997) employed a critical Thinking Map in a study to help students with difficulties in reading comprehension. Her subjects – four sophomores in a remedial reading program and two subjects in a special education program - showed improvement in vocabulary, reading comprehension and verbal thinking.

Schultz (2005) concluded that Thinking Maps directly improved reading comprehension in the three areas studied namely: Defining in context (circle map), Sequencing (flow map), and Cause and Effect (multi-flow map).

On the whole, Manning (2003) asserts that Thinking Maps are used by their creator - David Hyerle - as comprehension aids at all educational levels. Nearly the same direction is taken by Thomasina DePinto (cited in Hyerle, 2008) in that "Thinking Maps are the road to reading comprehension. In other words, when the teacher brings students to such a high level of fluency with Thinking Maps and they begin to identify text patterns on their own, they will be able to use fundamental skills vocabulary (describing, compare, causes, etc.) and respective cognitive maps (bubble, double bubble, multi-flow, etc., and have the meta cognitive awareness be able to explicitly transfer these processes and tools to reading comprehension through identifying text structures, (p. 5)".

## **V. Thinking Maps Instruction**

As an instructional strategy, Thinking Maps are to be taught directly to students for independent transfer across the disciplines, as Hyerle (2004) views. This does not mean that students stay passive while being spoon-fed by teachers. There are some important points about strategy instruction highlighted by some researchers. Howell & Nolet (2000) see that:

- (a) strategy instruction does not teach answers, it teaches how to arrive at answers;
- (b) emphasis is on the process of doing the task, not on the product that is completed;
- (c) feedback targets the strategy;
- (d) teachers teach strategies by making them visible to the student; and

(e) the best demonstrations show the effort, procedures, and even the revision of work..(p. 81)

In strategy demonstration, to Englert et al. (1991), the teacher talks through the process aloud (this is called "making your thought process public".) Verbal mediation is another aspect emphasized by Gerber (1987) where teachers have students talk through a solution while carrying out the steps. But Edmunds (1999) thinks that strategy instruction seems to be most successful in classroom where the teacher promotes a strategic environment. Such an environment might be featured by the principle of variety in classroom settings referred to by Harmer (1990). He thinks that, "variety means involving students in a number of different types of activity and where possible introducing them to a wide selection of materials.. In any one class, there will be a number of different personalities with different ways of looking at the world. The activity that is particularly appropriate for one student may not be ideal for another. But the teacher who varies his teaching approach may be able to satisfy most of his students at different times, (pp. 220- 221)." Once variety successfully happens, learning is, for students, always interesting and never monotonous.

Again, explicit instruction provides a means of efficiently communicating large amounts of information in a short period of time. This - as Trasborg (2005) mentions - promotes independent learning because modeling, feedback, and instruction are reduced as students become more independent. Also, this kind of instruction develops students' meta-cognitive skills as it demystifies the mental processes used during acquiring the new strategies, (Petitbon, 2005). Besides, it enhances students' understanding and memory of the reading text. Consequently, the explicit instruction of Thinking Maps can activate students' learning and accelerating self- autonomy. Students - in explicit instruction setting - can be asked to read, test reading, repeat reading, construct knowledge, classify it or even pattern it. Such actions help students be active in the learning process. Sheerin (cited in Malcolm & Rindfleisch, 2003) asserts that "learning is more effective when learners are active in the learning process, assuming responsibility for their learning and participating in the decisions which affect it, (p. 10)." Besides, "staying active and focused while you [the student] read, you will be in a better position to decipher the meanings in your texts, Coughlan (2007: p. 10)." To sum, Thinking Maps should be taught directly since the strategy is still novel to be implemented especially in EFL classrooms.

In a nutshell, Thinking Maps is a teaching-learning strategy with specific procedures used for many purposes - amongst them is developing reading comprehension. And the best way to teach such a strategy to fulfill its objectives - according to different researches reviewed - is to use the explicit way of instruction.

## **Summary of Review of Literature**

Because reading is elemental for learning, one must be able to master comprehension in order to facilitate knowledge acquisition. One of the most innovative strategies to develop reading comprehension is to use Thinking Maps.

Thinking Maps is a common visual language, a tool and a type of graphic organizers that define eight fundamental skills (defining in context - describing qualities - comparing

and contrasting - classifying – part-whole – sequencing - cause and effect – seeing analogies) represented in maps used by students as:

- a. a learning language in that it helps learners to communicate what and how they are thinking.
- b. a transformational language in that information is processed and transformed into new understandings, or transformed to other situations or other content areas.
- c. a meta–language in that learners convey, negotiate and evolve meanings with others and within themselves through visual patterns of thinking. For these, Thinking Maps is a learning strategy.

Teachers, also, use Thinking Maps as an instructional strategy for multi-purposes. Among them are developing instructional competencies, implementing an authentic way of assessment and acquiring an innovative approach for professional development.

The most prominent areas of research related to Thinking Maps are schema theory, cognitive science, metacognitive theory, cognitive apprenticeship, information processing theory, brain research, dual coding theory, transformational learning theory and involvement load hypothesis.

Many studies reviewed stress that there is a positive relationship between Thinking Maps and reading comprehension of expository texts if the strategy is implemented in an explicit instruction setting where students' learning can be activated, self-autonomy is accelerated and students feel fully involved in tasks under the cognitive apprenticeship of the instructor.

## **Context of the Problem**

Duke (cited in Iwai 2007) claims that educators ignore the teaching of expository texts. And it is generally assumed that students intuitively know how to understand what they are reading, and that comprehension is an automatic skill. Besides, rarely are students given guidance or strategies on how to decipher text structures and interpret information, Dicecco & Gleason (cited in Manning, 2003).

The situation with students at the Faculty of Tourism & Hotels is that they are required to read and comprehend the content of the expository texts and they are assumed to be already equipped with this language skill - reading comprehension.

In order for the researcher to assure of those assumptions, he conducted an unstructured interview with a group of sophomore students there. That interview revolved round the problem related to the material taught, the method of teaching adopted, and how those problems negatively affect their reading comprehension.



Having analyzed the responses given by the pilot sample, the researcher found out that students need to control information, reflect and comprehend what they read, organize information in their minds in such a way that allows them to recall it easily and to be deeply involved in their learning instead of being spoon-fed.

Consequently, the need arises for an innovative teaching strategy - a visual language - that focuses on learning and using many skills needed for successful reading.

## **Statement of the Problem**

The problem of the study was thus formulated as thus:

"Tourism and Hotels sophomore students (THSS) lack comprehension skills when reading expository texts. Most of those students are not able to identify the main ideas, derive facts and details, or give characteristics / attributions. Also, they can not understand sequencing or describe processes, or identify causes and effects of an action."

That is why the present study attempted to help those students overcome some reading comprehension problems throughout using Thinking Maps.

## **Research Questions**

1. What are the reading comprehension problems that Tourism and Hotels sophomore students (THSS) encounter while reading expository texts?
2. What are the features of a Thinking Maps instructional strategy?
3. What is the impact of Thinking Maps instruction to Tourism & Hotels sophomore students (THSS) on their awareness of Thinking Maps?
4. What is the impact of Thinking Maps instruction to Tourism & Hotels sophomore students (THSS) on their reading comprehension?

## **Purpose of the Study**

**The purpose of the study was four fold:**

1. Identifying the reading comprehension problems Tourism & Hotels sophomore students (THSS) encounter while reading expository texts.
2. Determining the features of a Thinking Maps instructional strategy.
- 3.. Exploring the impact of Thinking Maps instruction to Tourism & Hotels sophomore students (THSS) on their awareness of Thinking Maps.
4. Exploring the impact of Thinking Maps instruction to Tourism & Hotels sophomore students (THSS) on their reading comprehension.

## Significance of the Study

- a. Introducing a common visual language that can be used by both teachers and learners to be aware of their thinking processes, and how to construct knowledge.
- b. Providing EFL learners with a learning strategy that helps in acquiring language skills and study skills, and helps in communicating graphically.
- c. Introducing a new tool to teachers for assessing their performance as well as their students' in authentic situations.
- d. Attracting EFL researchers' attention to new areas of research related to reading comprehension and how it can be enhanced, through Thinking Maps, such as brain research, and the transformational learning theory.

## Limitations of the Study

### The current study was limited to the following:

- a. Sixty Sophomore students from Faculty of Tourism & Hotels, Suez Canal University.
- b. Expository reading texts constituting the content studied by THSS, because expository texts have clear specific text structures, contain technical vocabulary and require readers to have background knowledge, (Iwai, 2007).
- c. Five Thinking Maps: the circle map, the bubble map, the tree map, the flow map and the multi-flow map.
- d. Five reading comprehension skills: identifying the main ideas, deriving facts and details, giving characteristics, understanding sequencing, and identifying causes and effects.

## Definition of Terms

To facilitate more precise understanding of the study, the following terms were defined operationally:

**Thinking Maps** are "visual tools representing fundamental cognitive skills / thinking processes. Each map has guiding questions, key words and phrases, and a frame of reference to be soundly constructed."

**Thinking Maps instruction** is "an explicit method of teaching designed to create Thinking Maps awareness which includes information about Thinking Maps, and to help acquire skills for using them in reading."

## Research Methodology

**Participants:** The participants of the present study were sophomore students at the Faculty of Tourism & Hotels, Suez Canal University. The total number of the participants was 60 students. They were randomly drawn and divided into two groups where 30 students served as the experimental group / mapping group and the other 30 as the control group / non mapping group.

**Instruments:** Two instruments were required to serve the purpose of the study: the Thinking Maps Awareness (TMA) Test and the Reading Comprehension RC Test.

### **a. TMA Test**

It aimed at identifying the thinking processes as that correspond with the Thinking Maps under study, stating some guiding questions for constructing the Thinking Maps stating some questions identifying frames of reference of Thinking Maps, and then representing verbal texts in a graphic way, i.e., constructing Thinking Maps. The test which consisted of 4 questions with 5 points each was graded out of 20 marks, (see Appendix 2). It was judged valid and reliable. The reliability coefficient computed for the 20 items was 0.83 indicating high reliability.

### **b. RC Test**

This test consisted of 4 short comprehension passages, with 10 comprehension questions. The total score of the test was 20 marks: 2 marks per each question,(see Appendix 3). The test validity was determined by a group of EFL specialists. Using the test-retest approach, the reliability coefficient computed for the 10 questions was 0.87 indicating rather high reliability.

## **Overall Description of the Suggested Strategy**

To give the mapping group practice in comprehending expository texts via explicit instruction of Thinking Maps, the following points were taken into consideration.

- a. Structured Modeling Since comprehension is a complex skill that requires guidance and practice, (Johnson et al., 2006), the researcher helped students model Thinking Maps providing guidance and assistance.
- b. Exposure for "the more exposure a student has to language through reading, the greater possibilities that overall language proficiency will increase, (Anderson, 1999: p. 3)." Even the short term exposure to Thinking Maps - to Blount (2000) – could show measurable improvements in reading retention. With this in mind, the researcher made strategic knowledge visible and available to students all the time.
- c. In / inter / dependence. Students could work in Thinking Maps individually/ independently, as partners or in groups, (Danville Public school District, 2007; Matt-Kawryga, 2001).
- d. Explicit Instruction. Studies in best strategies for teaching and learning promote direct teaching of strategies. Without such instruction, it is difficult for student to transfer learning, (Danville public school district, 2007; Buxton, 2009). That is why the researcher taught students Thinking Maps in an explicit way.
- d. Emphasizing Cooperative Work. Peers had the skills to explain to another student how they handled the difficulties they encountered while reading. Besides, students learned to process verbally with a peer or group of peers what they had read verbally. After reading a passage, students discussed its content, and asked each other questions about it. Frequent, ongoing discussion about the meaning of the text in which students used the suitable visual tool to put / process the content in a Thinking Map was considered a promising approach to reading comprehension instruction. Furthermore, " peer - assisted learning strategies (PALS) took place since they "improve comprehension and oral reading skills, (Gerson & Baker, 1999: p. 2)."

The design of the suggested strategy had three stages described as follows:

1. *Explicit Instruction Stage*. In this stage, the researcher presented a theoretical background about Thinking Maps: definition, their relationship to the thinking processes, areas of research related to Thinking Maps, why use Thinking Maps, the impact of Thinking Maps on reading comprehension, and the appropriate method of teaching Thinking Maps. Here, the researcher familiarized the students with different expository texts and sample visual tools. This stage depended mainly on the current study review of literature.
2. *Implementation Stage*. This stage had 4 phases: Introductory, Activation, Generation & Independence. The two prominent phases with sequenced steps were Activation and Generation. The role of the researcher varied from one phase to another as well as the students', (see Appendix 4 for detailed description of the stage).
3. *Evaluation*. This stage was an ongoing process in which the researcher evaluated the student performance: the product the student produced and the process a student used to complete the product. Besides, peer assessment took place where appropriate- as mentioned earlier, (see Appendix 5 for Sample Mapping Exercises).

**Procedures:** The participants of the study (n = 60) were pre-tested on the Thinking Maps Awareness test and the reading comprehension test. Then, the control group / non mapping group (n = 30) was taught by their regular language instructor using the usual way of teaching reading whereas the experimental group / mapping group (n=30) was taught the same material but by using Thinking Maps-based instructional strategy. Having finalized the course of action, post tests were administered to all participants.

By the way, the treatment lasted for ten weeks with a total of 28 hours (8 hours for pre-posting & 20 teaching and training hours).

## Data Analysis and Results

All data collected were analyzed using SPSS. The t-values for the differences between the non mapping group (NMG) and the mapping group (MG) on pretests were calculated (see table 1).

**Table 1. t-values for the Differences between the Non Mapping Group and the Mapping Group on Pretests.**

Tests	Score	NMG = 30		MG = 30		t-value	Sig.
		M	SD	M	SD		
TMA	20	5.27	1.43	5.05	1.12	-0.650	0.185
RC	20	7.63	1.37	8.48	1.84	1.151	0.248

Notes: - TMA : Thinking Maps Awareness

- RC : Reading comprehension.

-  $p > 0.05$  (not significant)

As shown in table 1, the results indicated that the two groups of the study did not differ significantly in TMA or RC prior to the commencement of the study where t-values were:  $t = -0.65, p > 0.05$ ;  $t = 1.15, p > 0.05$ , respectively. Therefore, the two groups were judged equivalent.

The t-test was also used post testing to determine the difference in the mean scores between the two groups on TMA, (see table 2).

**Table 2: t-values for the Differences between the NMG and the MG on TMA Post tests**

Test	Score	df	NMG = 30		MG = 30		t-value	Sig.
			M	SD	M	SD		
TMA	20	29	5.76	1.16	13.87	2.80	14.770	0.000**

As indicated in table 2, the results showed that there were significant differences in the posttest mean scores for the MG on TMA ( $t = 14.770, p < 0.05$ ).

And as indicated in table 3 below, there were significant differences between the NMG and the MG on RC posttest for the MG ( $t = 12.012, p < 0.05$ ).

**Table 3. t-values for the Differences between the NMG and the MG on RC Posttests**

Test	Score	df	NMG = 30		MG = 30		t-value	Sig.
			M	SD	M	SD		
RC	20	29	8.85	1.31	14.95	1.62	-15.981	0.000**

In order to determine whether there were mean differences between pre-post tests of the MG's sub-skills of reading comprehension, t-tests were to be administered. Table 3 shows the results below.

**Table 4: t-values for the Mean Differences of the MG on RC Sub skills Pre-post Testing**

RC sub-skills	df	Pre-test		Post-test		t-value	Sig.
		M	SD	M	SD		
MI	29	2.05	0.60	3.22	0.41	9.669	0.000**
F & D	29	1.58	0.56	3.00	0.47	10.774	0.000**
Char.	29	1.82	0.50	3.01	0.48	10.770	0.000**
Seq.	29	1.60	0.54	2.92	0.48	11.849	0.000**
C & E	29	1.43	0.55	2.80	0.47	10.598	0.000**

Notes:

- MI = identifying the main ideas. - F & D = deriving facts and details.
- Char. = giving characteristics - Seq. = understanding sequencing
- C & E = identifying causes and effects

As shown in table 4, results from the t-tests revealed that the MG students scored significantly on post tests higher than on pre tests in RC sub-skills, ( $p < 0.05$ ).

Furthermore, the size of the practical effect caused by the Thinking Maps instructional strategy had to be calculated, (see table 5 below).

**Table 5: The Level of the Effect Size of the Thinking Maps-based Strategy on the Mapping Group's TMA and RC**

Test	Score	t-value	df	<sup>2</sup>	ES level
TMA	20	14.770	29	0.78	Large
RC	20	15.981	29	0.71	Large

As indicated above, using the Thinking Maps-based strategy yielded a large effect size on the MG's TMA and RC.

Based on these results, the researcher had a fairly strong argument for the significant impact of Thinking Maps instruction to Tourism and Hotels sophomore students (THSS) on their Thinking Maps awareness as well as their reading comprehension skills.

## Discussion

The major purpose of this study was to test the impact of Thinking Maps instruction on Tourism & Hotels students' reading comprehension. The results of the post-tests provided answers to the 4<sup>th</sup> and 5<sup>th</sup> questions of the study and showed that the mapping group did significantly better than the nonmapping group in Thinking Maps awareness and reading comprehension. The completion of Thinking Maps awareness test was not only a measure of reading comprehension, it also revealed students' implicit awareness of text structure knowledge.

The findings provide evidence that Thinking Maps instruction and training raised students' awareness of those maps and improved their skills to use them. This is consistent with other research findings (e.g. Ball, 1998; Buxton, 2009; Eloff & Ebersohn, 2004; Frieberg & Driscoll, 2000; Holzman, 2004; Hyerle, 2000 - 2009). Such development may be due to and explained by the high involvement load of Thinking Maps tasks. When students worked on Thinking Maps activities, they had to go back and forth several times to deeply process information, sort and make connections among ideas, mapping verbal texts... etc.

Another possible explanation is that the mapping group students might have been highly motivated intrinsically and extrinsically in learning English by being exposed to an innovative method of teaching away from the monotonous traditional one used by most language teachers and instructors. Besides, it is believed that each time they got theoretical

background for any aspect of Thinking Maps followed by task-based activities, they tried to find out how such a process could be applied to other contexts stressing the notion that learning through activity is a preferable method, and supporting Ciborowski's claim (1995), "the content teacher who uses the textbook well ... teaches reading, thinking, and content concurrently, [and] is a strategy teacher who models his or her own strategy by thinking out aloud or in other observable ways, (p.9).

The results suggest that the explicitness of instruction and the presence of Thinking Maps facilitated students' reading comprehension when they have read novel texts silently to themselves, and played important roles in students' ability to generalize / transfer the learning to novel textual material. In the current study, mapping students were given the dual task of learning, referred to by Long (cited in Eloff & Ebersohn, 2004) not only the content (i.e., declarative knowledge, "knowing what") but also the procedures necessary for constructing Thinking Maps independently (i.e., procedural knowledge, "knowing how"), either explicitly or implicitly. One might conclude then that the immediate acquisition of the expository textual material was manageable on mapping students because of the increased support provided during explicit instruction.

And referring to Manning's (2003) view who points out that, "as students rarely are able to grasp key concepts and understand content independently, strategies can prove to be invaluable tools for helping students construct meaning from text, research corroborates that students, in fact, can make substantial gains in reading comprehension (p.20)," it can be assured that through given direct and carefully shaped instruction, comprehension can be improved and transfer can be expected.

Also, the findings of this study lend support to the position that reading comprehension can be greatly improved by teaching students to impose a structure upon the text, especially if the structure provides a basic framework for readers' thinking processes as they read.

Again, the present study confirmed that students who received Thinking Maps instruction and intensive exposure to different text structures training were active participants in classroom activities and this, in turn, improved their reading comprehension. Those activities were taught to help students see the overall organization of texts and better understand their structures. Besides, the independence and interdependence are seen to have provided students with a good foundation of reading development. Different types of reading (active, shared, repeated) might have an experiential base for transforming knowledge and positive experience about Thinking Maps to different language contents that helped them afterwards read unfamiliar and different passages.

Similar findings also emerged in Schultz's study (2005) in that students' practice in using Thinking Maps increased reading comprehension sub skills in the 3 areas studied (finding the main idea – sequence - cause and effect).

One of the important explanations of the significant impact of Thinking Maps instruction on reading comprehension sub-skills of the mapping group of the current study – in the research's belief – is the implicit and explicit use of different levels of Bloom's taxonomy in tasks matched with different Thinking Maps (Hyerle, 2008) dependently and / or independently manifesting the two axis of the taxonomy: complexity that establishes the level of thought , and difficulty that determines the amount of effort within each level, (Sousa, 2001).

Thus, the practice of short, quick, daily communication and dialogue might be behind the improvement of identifying the main ideas of the mapping students. Only when in depth evaluation is required, facts and details are to be provided. Besides, considering the specialization of the participants - Tourism & Hotels - seems to urge them to provide strategic and visible descriptive details or give characteristics / attributions of people, things and places using adjectives in order to attract the listeners' attention or to persuade them to read about, do something or visit a place voluntarily. When the mapping students were given stages and sub-stages of an event or order of operation with key words or clues such as first, then, next, second, they tended to find linking lines and construct images forming the right sequence. Moreover, they seem to have awareness of causal relationships. Every day, they are met with different types of reasoning including the causal reasoning in which isolated facts are to be collected, actions are to be classified, and associations and assumptions showing causes and effects are to be made. Thus, they might have matched the causal relationship of the messages in their memory with that of message in texts they have read.

## **Conclusions**

The Thinking Maps-based instructional strategy proves to be effective in improving reading comprehension of Tourism & Hotels students. In fact, explicit instruction and training with hands-on activities, and ongoing assessment had a positive impact on the quality of Thinking Maps awareness and then on understanding different text structures. It is conceivable that providing students with theoretical background about Thinking Maps - definition, use, how to construct, ... might have boosted the students' attention and effort to meet challenges in such a way that helped them develop higher level cognitive skills, use deeper levels of processing and get actively involved in tasks and activities required. The current strategy, while serving as a model of an effective instructional approach, is probably sustainable in EFL contexts for more than one reason. First, it will not lose its ability to attract EFL instructors in teaching language skills. Second, it does not require specific types of learners or classrooms nor certain text structures. Third, pre-service as well as in-service EFL teachers can improve their quality of performance using such a strategy.

Although the current study emphasized the positive impact of Thinking Maps on reading comprehension, the strategy used in the study seems to succeed in developing different language skills, motivating students to achieve better and getting involved in classroom participations. Moreover, the class size, or the educational level do not seem to be obstacles to implement such a strategy in EFL classrooms.

## **Recommendations**

In the light of the results reached and the above mentioned conclusions, the following recommendations seem pertinent:

1. It is recommended that a Thinking Maps program become a component of the prescribed curriculum of reading classes.
2. EFL teachers need to be trained on how to introduce and model Thinking Maps for students in order for this type of learning approach to be successful.
3. Since the ultimate aim of teaching is to help develop independent learners, Thinking Maps appear to provide a tool for improvement of meta-cognitive skills.



4. Reading textbooks of expository text should be taught using Thinking Maps.
5. Thinking Maps classroom activities should be task-oriented and engaging. When students are given specific directions to fulfill a specific and understandable purpose by working on a task, they are more actively involved. Active involvement is important for effective teaching and learning.

### **Suggestions for Further Research**

1. More research is needed to explore the effect of Thinking Maps instruction on: a. writing skills, b. questioning skills, c. taking notes skills, d. summarizing skills, e. communication skills, f. test taking strategies, g. integrating language skills.
2. This study should be replicated in other colleges where reading, writing and study skills are offered.
3. Conducting studies to use Thinking Maps for improving reflective learning, accelerating learning and knowledge retention seems necessary.
4. A comparative study is needed to test the impact of Thinking Maps instruction on good readers versus poor / struggling readers.
5. A study examining immediate reading comprehension versus delayed reading comprehension of EFL learners is required.
6. Situation Analysis in reading classes seems important to explore what types of and how far Thinking Maps are used by teachers as well as by students, when using Thinking Maps as an instructional strategy.

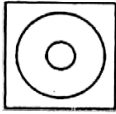
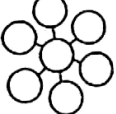
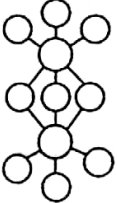

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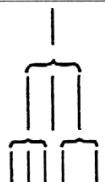
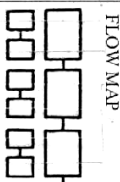
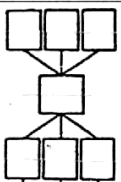
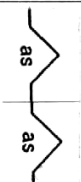
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**Appendix (1)**  
**Figure 1: Template of Thinking Maps Overview**

Thinking Pattern	Thinking Process	Thinking Map as Visual Tool	Guiding Questions for Constructing Thinking Maps	Key Words & Phrases	Design
DIALOGICAL THINKING	Defining in context, Brainstorming		<ul style="list-style-type: none"> <li>What are the context clues that help define this word, topic, or idea?</li> <li>What do you know (or would like to know) about this word, topic or idea?</li> <li>How would you define this idea?</li> <li>What information would you include in your brain-storming or defining of this word, topic or idea?</li> <li>What do you think this word, topic, idea means?</li> </ul>	<p>Context List</p> <p>Define</p> <p>Tell everything you know</p> <p>Brainstorm/ Tell about</p> <p>Identify/ Discuss</p> <p>Relate prior knowledge</p> <p>Explore the meaning</p> <p>Associate</p> <p>Generate/ Describe</p> <p>Context clues</p>	<p>The topic is in the middle, smaller circle. Everything you know about the topic is in the larger circle. A box, that may be included, around the entire map is a " frame of reference" that is used to answer the question " How did I learn this?" (The frame of reference can be used around any of the maps.)</p>
EVALUATIVE THINKING	Describing using Adjectives		<ul style="list-style-type: none"> <li>How would you describe this person, place, thing, idea, concept, picture, feeling, etc?</li> <li>What characteristics can be used to describe this noun?</li> <li>What are the attributes of this number or concept?</li> <li>What qualities are important in this concept?</li> <li>What are the properties of this scientific element?</li> </ul>	<p>Describe</p> <p>Use vivid language</p> <p>Use your five senses</p> <p>Qualities</p> <p>Attributes</p> <p>Characteristics</p> <p>Properties</p>	<p>The topic being described is in the center bubble. The outer bubbles contain adjectives and adjective phrases describing the topic.</p>
EVALUATIVE THINKING	Comparing and Contrasting		<ul style="list-style-type: none"> <li>What are the similarities and differences between these two things?</li> <li>How are these two things alike and different?</li> <li>Which similarities do you think are the most important?</li> <li>Are there any details that are unique to one thing and not the other?</li> </ul>	<p>Compare</p> <p>Contrast</p> <p>Similarities</p> <p>Differences</p> <p>Distinguish between</p> <p>Differentiate</p>	<p>In the center circles are the words for the two things being compared and contrasted. In the middle bubbles, use terms to show similarities. In the outside bubbles, describe the differences. If there are too many similarities or differences, students should prioritize and keep only the most important.</p>
INDUCTIVE & DEDUCTIVE THINKING	Classifying and Grouping		<ul style="list-style-type: none"> <li>How would you group this information?</li> <li>Can you sort these objects into groups?</li> <li>What are the ideas and details that support your main idea?</li> <li>What are the members of this category?</li> <li>Do some of the items fit into more than one category?</li> <li>Is there another way to categorize these things (according to a different frame of reference)?</li> </ul>	<p>Classify</p> <p>Sort</p> <p>Group</p> <p>Categorize idea</p> <p>Identify main idea and supporting Idea</p> <p>Give sufficient and related details</p> <p>Kinds of</p> <p>Taxonomy</p>	<p>The category name is on the top line, subcategories on the second level, details under each subcategory.</p>

(Continued)

Thinking Pattern	Thinking Process	Thinking Map as Visual Tool	Guiding Questions for Constructing Thinking Maps	Key Words & Phrases	Design
INDUCTIVE & DEDUCTIVE THINKING	Part to Whole Relationship	BRACE MAP 	<ul style="list-style-type: none"> <li>• What is the name of the whole object?</li> <li>• What are the major physical parts of the object?</li> <li>• What are the subparts of each major part?</li> <li>• What is this object a part of?</li> <li>• What parts, if any, are missing?</li> </ul>	<p>Parts of</p> <p>Show the structure</p> <p>Take apart</p> <p>Identify the structure / physical / components anatomy</p>	<p>On the line to the left, the name of the whole object is written. On the lines within the first brace, list the major parts. The subparts are listed in the next set of braces.</p>
SYSTEMS DYNAMICS THINKING	Sequencing and Ordering	FLOW MAP 	<ul style="list-style-type: none"> <li>• What is the name of the event or sequence?</li> <li>• What are the stages of each event?</li> <li>• Are there any sub-stages of the event?</li> <li>• What larger events might come before or after the event you are sequencing?</li> <li>• What happened next?</li> <li>• In what order should you sequence these things?</li> </ul>	<p>Sequence</p> <p>Put in order</p> <p>Retail / Recount cycles</p> <p>Describe process patterns</p> <p>Show the process</p> <p>Solve multi-step problems Describe change</p>	<p>Each stage of the event is in the larger rectangles. The substages are in smaller rectangles below the larger ones. Not all flow maps will have substages.</p>
SYSTEMS DYNAMICS THINKING	Causes and Effects	MULTI-FLOW MAP 	<ul style="list-style-type: none"> <li>• What are the causes and effects of this event?</li> <li>• Why did this event take place?</li> <li>• What happened because of this event?</li> <li>• What are the effects of this event?</li> <li>• What was the motivation behind this event?</li> <li>• What will be the results of this event?</li> </ul>	<p>Causes and effects</p> <p>Discuss the consequences</p> <p>What would happen if?</p> <p>If ... then</p> <p>What happened because of</p> <p>Predict</p> <p>Describe the change</p> <p>Identify the motivation behind</p> <p>Discuss strategies</p> <p>Identify the results of</p>	<p>The event is in the center rectangle. On the left side, causes of the event. On the right side, effects of the event.</p>
METAPHORICAL THINKING	Seeing Analogies	BRIDGE MAP 	<ul style="list-style-type: none"> <li>• What is the similar relationship (relating factor) between these two words?</li> <li>• How are these two words related to each other?</li> <li>• What sentence can you write with these two words?</li> <li>• Is this relationship exactly the same for both pairs of things?</li> <li>• What other pairs of relationships have the same relating factor?</li> </ul>	<p>Identify the common relationship</p> <p>Guess the rule</p> <p>Symbolism/ interpret symbols</p> <p>Metaphor</p> <p>Allegory</p> <p>Analogy</p> <p>Ratio</p> <p>Simile</p>	<p>On the far left line, write the relating factor. On the top and bottom of the bridge, write in the first pair of things that have this relationship. On the right side of the bridge, write the second pair with the same relationship. The line of the bridge represents the relating factor between the pair of things.</p>

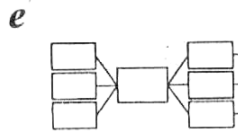
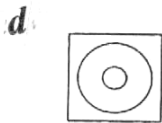
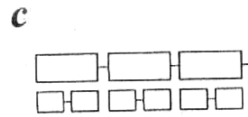
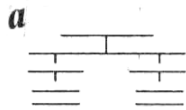
Source: A Contemplation on the Theorization of Thinking Maps: David Hyerle's Works from 1993-2009.

## Appendix (2)

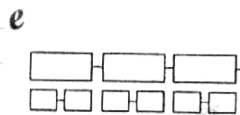
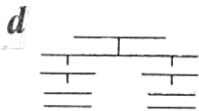
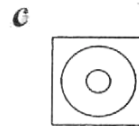
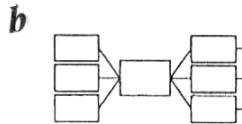
### Thinking Maps Awareness (TMA) Test

Student's Name : \_\_\_\_\_ Date: \_\_\_\_\_ Time: 2 hours

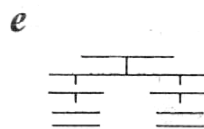
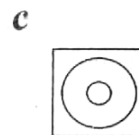
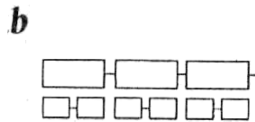
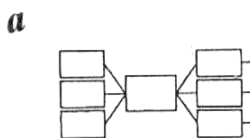
I. Name the following thinking maps, then state the appropriate thinking process before each:



II. State three guiding questions for constructing each thinking map below:



III. State three questions identifying the frame of reference of the following thinking maps:



**IV. Read the following texts carefully, then represent them graphically (i.e. construct Thinking Maps.)**

**\* Note: more than one Thinking Map might be represented for one text.**

**A.** Thailand, once Siam, is today deservedly known as the land of smiles. The Thai people are naturally charming and polite and the standard of service you receive in hotels and restaurants is universally high.

The Capital, Bangkok, has something for everyone. Tiny sampans and long-tailed taxi boats swarming all over the river and k longs.... Saffron clad monks making their way to their devotions... and *Waks* (temples) everywhere. At night, the city really comes to life pitch black bars and discotheques in Patpong sumptuous restaurants and night clubs in the big hotels, and typical Thai restaurants featuring local cuisine with accompanying classical dance performances or Thai boxing.

**B.** The signs of affirmation and negation are expressive of our feelings; we give a nod of approval with a smile to our children, and shake our heads from side to side with a frown to them when we disapprove. With infants the first act of denial consists in refusing food; and I repeatedly noticed with my own infants that they did so by withdrawing their heads sideways from the breast, or from anything offered them in a spoon. In accepting or taking food there is only a single movement forward, and a single nod implies an affirmation. On the other hand, in refusing food, children frequently move their heads several times from side to side, as we do in shaking our heads in negation. Moreover, in the case of refusal the mouth is often tightly closed so that this movement might likewise come to serve as a sign of negation.

**C.** Bacteria cause food poisoning when they build up to sufficiently high numbers in your food. Most people would become ill after eating food with one million food poisoning organisms per gram.

We give bacteria the opportunity to grow and multiply in our food by poor food-handling techniques. Recent legislation has concentrated particularly on how we control the temperature of our food.

Multiplication of bacteria is a simple process, the bacterial cell splits into two once every 10–20 minutes, provided it has suitable conditions. If you work this out, using 10-minute intervals, you will find that one bacterium can become over one million in 3 hours and 20 minutes. Since our food may be already contaminated with thousands of food-poisoning bacteria per gram, before we even start to handle and prepare it, you can see the potential bacteria have for making us sick.



**D.** Tourism has the power to enhance the environment, to provide funds for conservation, to preserve culture and history, to set sustainable use limits, and to protect natural attractions. It can destroy vegetation, create overcrowding, litter trekking areas, pollute beaches, result in overbuilding, eliminate open space, create sewage problems, cause housing problems, and ignore the needs and structure of the host community.

It is being recognized that tourism must preserve and protect the environment and natural attractions so that people will continue to travel and to set use limits so that sites will be truly sustainable. The problem is how to do this.

**E.** The Red Sea is 1930 km long bordered by Egypt, Jordan, Saudi Arabia, Sudan, Ethiopia, Yemen and Djibouti. It is characterized by its warm climate all year round, its coast temperature ranges between 35 and 41 degrees and the temperature of its highly saline water varies between 21 and 28 degrees. This made it an ideal environment for the growth of coral reefs, colourful fishes of various species and rare marine life. The coast of The Red Sea extends from El Ein El Sokhna to Halayeb for 1080 km and its beaches are distinguished by their soft sand and clear turquoise sea where the underwater visibility is more than 30 metres and diving is permitted at 45 metres deep.

## Appendix (3)

### Reading Comprehension (RC) test

Student name :

Date :

Time: 2 hours

Enclosed are 4 comprehension passages. Read each one carefully, then answer the questions:

I.

I recently had the bad luck to stay in your hotel, and I am now forced to write to you to express my disgust with the service you provided.

From the moment I arrived I was treated in an unfriendly manner. I also found that the promises you made in your advertisement were not true. The hotel was not relaxing - it was noisy and uncomfortable. The restaurant was not romantic, and indeed it was hardly a restaurant, as it offered very little variety of food.

Furthermore, there was not transport into town. When I complained about this I was simply told there was a bus strike. Surely you could have provided a taxi service for your guests...

#### Questions:

1. List the problems that made guest complained about the service of the hotel? [identifying causes and effects]
2. The guest used certain adjectives in a vivid language to express what he felt. What are they ? [determining characteristics]

## II.

“For the last 30 years, Crowchester Chemical Company has not only blackened our skies and polluted our rivers, it has been slowly and surely poisoning us in our own homes. Other big companies treat their chemical waste. Not Crowchester Chemical Company. They think that money is more important than our comfort and our health. And the suffering of Crowchester cannot be measured in terms of pounds and pence. 37 people are seriously ill. Hundreds more are living in misery. The Crow River will never again be fit for drinking water. Crowchester Chemical Company must compensate us all for the trouble and the suffering they have brought among us.”

“Pollution from factories is not the only problem. Motor vehicles and aircraft pollute the air. Oil tankers pollute the sea. Many city governments discharge sewage into their rivers and leave mountains of garbage in the countryside. Man is a dirty and wasteful creature. Yet all of this could be avoided, with a little imagination. There are engines which don't cause air pollution. Garbage can be recycled and sewage can be converted to energy. Private companies won't make the necessary investments. This money really does have to come from Government.”

### Questions :

1. What does this passage revolve around? [identifying the main idea]
2. Hundreds of people in Crowchester are living in misery. Clarify with reference to the passage. [deriving facts and details].
3. How are air and sea polluted ? What are the consequences ? [identifying causes and effects].

### III.

The "golden age" of mummy-making was around 1.000 BC, by which time even the brain could be removed, via the nose. Next an incision was made in the left side and the rest of the *viscera* drawn out, leaving only the heart. The empty abdominal cavity was then rinsed with oils or palm wine and coated with liquid *resins*.

The extraction of the water, comprising about three-quarters of the human body, remains a mummy-maker's secret, but it is thought that the body was packed in dry *natron*, containing sodium bicarbonate and sodium chloride, which drew off the liquid in 35 to 40 days. Finally the desiccated body was bulked out with padding, painted to simulate life and wrapped in linen bandages.

#### Questions:

1. What does the passage revolve about ? [identifying the main idea]
2. Put the following processes in order :
  - \* The water was drawn off the body.
  - \* The abdominal cavity - aside the heart - was made empty.
  - \* The body was made to look like life after death.
  - \* The body was cleaned carefully.
  - \* The brain was removed from the body.
  - \* The body was filled out with padding. [understanding sequencing]

#### IV.



The Rosetta Stone was found in 1799 while French soldiers stationed by Napoleon at Fort St. Julien (also known as the Qaitbay Fort, near the Rosetta mouth of the Nile) were carrying out rebuilding work. The stone fell into the hands of the British under the Treaty of Capitulation in 1801, and was taken to the British Museum.

The large block of black basalt bears inscriptions in Greek, demotic, and hieroglyphic scripts. Although only the Greek could be understood, it was at once conjectured that the texts were identical, and that the stone would provide the key to deciphering hieroglyphics, the knowledge of which was lost in the fourth century A.D. A number of scholars set to work on the inscriptions. Thomas Young, a British physicist and physician, worked for twenty years and made significant progress, but it was the Frenchman Jean François Champollion who made the final breakthrough in 1822, paving the way for the modern study of the ancient language.

#### Questions:

1. Sort what is on the Rosetta Stone. [deriving facts and details]
2. How would you describe the Rosetta Stone? [determining characteristics].
3. Put in order :
  - \* The Rosetta stone was taken to the British museum.
  - \* A French man achieved great successes in understanding what is on the Rosetta Stone
  - \* The Rosetta Stone was first discovered by French soldiers.
  - \* A British man achieved some progress in deciphering what is on the Rosetta Stone. [understanding sequencing]

## **Appendix (4)**

### **Thinking Maps-Based Instructional Strategy**

#### **Implementation Stage**

**Note:** students were encouraged to work in pairs or/ and groups.

This stage had 4 phases described in detail as follows:

#### **A. Introductory Phase**

Students were given handouts with Starter Maps to recognize. Then they were given worksheets and scaffolded as they read and constructed maps from the simple expository text on worksheets. Direct explanations and modeling were carried out so as to strengthen students commitment to learning.

#### **B. Activation Phase.** This phase had 5 steps:

1. The researcher sparked the interest of students by activating their prior knowledge. This could be accomplished by asking open-ended questions especially formulated for three important objectives:
  - a. to get students to think about what they already know about the topic.
  - b. to direct their focus and attention on a purpose for which they will be reading, and.
  - c. to spark their interest and curiosity in the upcoming topic.
2. When students participate in discussions, making meaningful connections between what is familiar, what is known, what is experienced and what is about to be learned, learning therefore became relevant, and discovering, constructing and reconstructing ideas was more likely to occur. The researcher, on the other hand, could determine how much his students knew about and did not about a topic.
3. The researcher helped students construct mind maps to teach them to think about text structures. Students were encouraged to construct additions, pictures or any other "cue" that would help them organize and remember the text. Gradually, students had to be able to independently construct their own maps.

4. Mapping exercise could be an effective way to consolidate learning. They could serve as an incentive to reread. Mapping had to be a familiar task, because practice and repetition produce feelings of success and confidence.
5. The researcher could distribute reading maps prior to the reading assignments, having students filled in the missing information as they read. Besides, they could be given short texts in order for them to identify the text structures. Then, over time, the researcher could provide frames containing less information forcing reading to identify the structures (e.g.) describing, sequencing, cause and effect .... etc.).

**c. Generation Phase.** This phase was a reading-based Thinking Maps generation. It was mainly directed, where the researcher gave directions to students while they were constructing maps. The researcher helped the students become more comprehenders and thinkers. Readings given to students were not to be lengthy. When they were lengthy, students might feel little control over their own learning and became passive, losing track of what had been read as attention faded. The researcher-dominated actions were to be to the least so that students might feel more in control and be more self-assured, more confident, and considerably more ready to read and understand the texts in hand.

This phase was considered a six-step technique in which students were engaged actively in reading. They were taken to focused reading sessions following the steps coming:

1. *Survey Reading.* Before students began reading, they surveyed or skimmed the text they were about to read. The purpose of this global reading was to gather the information necessary to focus and formulate goals.
2. *Question Reading.* Questioning would help students' minds to engage and concentrate. Students were required to generate questions on the text they read. The better the questions, the better their comprehension was likely to be. And when the students' mind was actively searching for answers to questions, it became engaged in learning.

3. *Focus Reading*. Students read the text intensively to fill the information around the mental structures they had been building. They were required to read each section (one at a time) in detail with their questions in mind taking care to understand all the points that were relevant. They were to look for answers while reading; it could help them to take notes in their preferred formats to be used afterwards.
  4. *Map Reading*. Students were required to construct the visual maps that match the thinking processes manifested in reading texts. After each section read, students stepped, recalled their questions and saw if they could answer them from memory and then represented them graphically. The purpose of this step was to retrain the mind to concentrate and learn as it reads using the visual tools.
  5. *Repeat Reading*. In this step, students repeated reading the text since such an activity could improve their reading comprehension. Besides, the more exposure a student to language through reading, the greater the possibilities that overall language proficiency would increase.
  6. *Review Reading*. Once students had done repeated reading and run through the exercise of recalling the information, they could move on to reviewing it. This review could be by reexamining the maps or by discussing them with colleagues. The main purpose of this step was to refine the students' mental organization and begin building memory.
- D. Independence Phase.** This phase was independently projected Thinking Maps. Advanced topics and themes were presented to students. The researcher monitored, revised and assessed the Thinking Maps that had been/ were being done independently. The success of this phase depended upon the researcher's shift to more student-centered strategy learning.



## Appendix (5)

### Sample Mapping Exercises

1. Define / Identify the text structures in the following passages, then represent them graphically.

- a. Food poisoning in Britain is caused by Salmonella group of bacteria. These poisonous bacteria cause diarrhea, stomach pains, sickness and, in severe causes, death. [cause and effect].
- b. The coral reef that bounders most of the Sinai coastline is considered one of the most beautiful in the world. It boasts incredibly varied and abundant fauna, which has earned the sea bottom the nickname of " Allah's garden". [Describing].
- c. There are two methods of braising: brown braising, used for joints and portion-sized cuts of meat; white braising, used for vegetables and sweet-breads. [Classifying].
- d. Silver service means that food is prepared in the kitchen and brought on silver platters to the table. [Defining in context].
- e. Call Directory Assistance and ask for the number of someone in another part of the country. Spell their name for the operator. Get their number and the area code and repeat it, just to be sure you got it right. [sequencing].

2. Read ! Check understanding, then construct the appropriate Thinking Maps where possible.

**1** • Guide books, leaflets and pamphlets containing information about places worth visiting and the country's culture, and other literature designed to make the tourists' stay a happy and memorable one should be freely available. *Courteous*, efficient and friendly service at tourist hotels or other centres of accommodation should be provided. The country as a whole should be kept clean and free from litter to make a favourable impression on tourists.

If countries hoping to attract more tourists tried to adopt these suggestions — if they have not done so already — their tourist trade, with all its accompanying benefits to their countries, would surely increase.

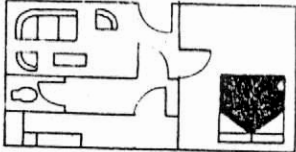
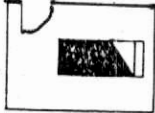
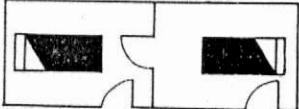


**Exercise 2 What do they mean?**

Match the words in the box with the correct meaning from List A or B. Use the Glossary to help you. One of them is done for you.

A	Word box	B
a book (or table) where reservations are written	restaurant log book	a book where the names of the staff are written
a client; someone who buys something or receives a service	customer	an employee; someone who works at a certain place
the main course or dish of a meal	dessert	a sweet course eaten after the main meal
the service tax added to the bill	cover	a set of crockery, cutlery, glassware and linen for one customer
the man who serves the meal	waiter	the man who answers the telephone
knives, forks, spoons	cutlery	plates, cups, saucers

**Exercise 3 Which is which?**

Look at the pictures. These are different types of rooms at the Sun Hotel. Match the words in the box to the pictures.

adjoining / connecting rooms suite single double twin	1 	
3 	4 	5 

**Exercise 4 What do they mean?**

Do the words in the word box go with A or B? The first one is done for you.

A	Word box	B
← paying less money	discount	paying more money
money paid for the laundry	service tax	money paid for general service
cost of eating at a restaurant	room rate	cost of staying in a room for a night
person who supervises accounts	reservation manager	person who supervises reservations and reception work

### Exercise 5 Reading practice

Nadia reads this article about some of the employees in a hotel. Read, then answer the questions.

<b>HOW TO KEEP A HOTEL IN GOOD CONDITION</b>	
<p>Keeping hotel rooms and public places in good condition is not an easy job. Many hotels have special workshops and staff to take care of this.</p> <p>An important employee in any hotel is the upholsterer. He sews torn furniture, covers and carpets, and changes the upholstery in the guest rooms.</p> <p>When a bed or table is broken, the carpenter fixes it. The carpenter repairs all broken furniture, doors and windows.</p>	<p>What about the condition of the walls? Some hotels have special painters who paint walls regularly. Sometimes they have paper-hangers who hang new wallpaper.</p> <p>Plumbers take care of bathroom equipment. They fix taps and drains, and check the bathrooms regularly.</p> <p>Finally, a group of technicians take care of the hotel equipment. They fix lifts, air conditioners and central heating units when they are out of order.</p>
<p>These employees do not only repair damages, they try very hard to prevent them. So, next time you go to a hotel that is kept in good order you know who to thank.</p>	

### Exercise 6 Let's check

Are these sentences true or false? Correct the false ones.

- (a) The upholsterer fixes doors and windows.
- (b) The carpenter repairs broken beds, tables and chairs.
- (c) The plumber changes electric lamps and wires.
- (d) The paper-hanger hangs new wallpaper in rooms.
- (e) It is more important to repair damage than to prevent it.

### Exercise 7 Do not disturb!

Here are two cards which you find outside a hotel room. Below are the instructions the chambermaid should follow when she sees the cards. Match the cards to the instructions.



The chambermaid must open the door with her master key to clean and tidy the room.



The chambermaid must not go into the room.

### Exercise 8 Reading practice

Nadia Hamed wants to work at the Sun Hotel. She fills in this application form. Read, then answer the questions.

THE SUN HOTEL	
Full name: <i>Nadia Hamed</i>	Date of birth: <i>12th March 1970</i>
Place of birth: <i>Cairo, Egypt</i>	Nationality: <i>Egyptian</i>
Marital status: <i>Single</i>	Education: <i>Egyptian Commercial School</i>
Experience: <i>6 months at Happy Hotel</i>	Languages: <i>Arabic and English</i>
Application for: <i>A job at the Sun Hotel</i>	

### Exercise 9 Let's check

Answer these questions about Nadia. Example: (a) Nadia is nineteen years old.

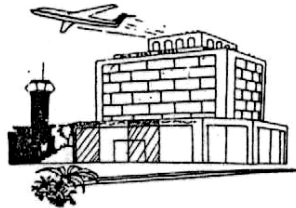
- |                                     |                              |
|-------------------------------------|------------------------------|
| (a) How old is Nadia?               | (d) Is she married?          |
| (b) Where was she born?             | (e) When is her birthday?    |
| (c) Which languages does she speak? | (f) What is her nationality? |

### Exercise 10 Types of hotels

Match the sentences to the pictures.

Example: (a) airport hotel - a hotel for people who travel by plane (2)

(a) airport hotel



(b) resort hotel



(c) motel



- 1 A hotel which has many small buildings with garages.
- 2 A hotel for people who travel by plane.
- 3 A hotel for tourists, for example near a beach.

### Exercise 11 Reading practice

Nadia continues her training in the housekeeping department. Mrs. Rose Johnson, the executive housekeeper, tells her what she has to do to put the rooms in good order. Read the following list of steps, then answer the questions.

#### CLEANING AND TIDYING A GUEST ROOM - DAILY STEPS

- 1 Clean all the ashtrays and empty the waste paper baskets.
- 2 Air the room and the bed(s) while cleaning the bathroom.
- 3 Change and make the bed(s).
- 4 Dust the furniture.
- 5 Vacuum the carpet.
- 6 Put all room accessories in their place.
- 7 Draw the curtains or blinds.

### Exercise 12 *Reading practice*

Nadia continues her training at the restaurant. She hears this conversation between a waiter and a guest. Read the conversation.

*Waiter:* Are you ready to order now, sir?

*Man:* Yes, I think so.

*Waiter:* What would you like to start with, sir?

*Man:* I think I'll have cream of mushroom soup.

*Waiter:* Yes. And for the main course?

*Man:* I'll have the steak royal.

*Waiter:* How would you like your steak done, sir?

*Man:* Medium.

*Waiter:* And what would you like to drink with your meal?

*Man:* I'll have an orange juice, please.

*Waiter:* Would you like to order your dessert now, sir?

*Man:* Yes. I'll have a fruit salad and a black coffee.

*Waiter:* Very good, sir. Will that be all?

*Man:* Yes, thank you.

### Exercise 13 *Let's check*

Now answer these questions.

- (a) What does Nadia hear?
- (b) Who does the guest speak to?
- (c) What does Mr Essam want to start with?
- (d) How does he like his steak?
- (e) What does he have to drink with his meal?
- (f) What would he like for dessert?

### Exercise 14 *Taking down orders*

Look again at the conversation in Exercise . Write the man's order on this form.

<b>THE SUN HOTEL RESTAURANT</b>	
Orders:	
Date:	Signature:

### Exercise 15 Reading practice

Nadia has to learn about reservations at the reception desk. The Front Office Manager, Mr Magdi Mousa, shows her this table of room rates. Read, then answer the questions.

Kind of Room	Definition	Room rate
single room	a room for one person	LE 60
double room	a room with a bed for two people	LE 80
twin room	a room with two single beds for two people	LE 80
adjoining room	two rooms beside each other connected by a door	LE 120
suite	a guest room that has one or more bedrooms and a sitting-room	LE 150

The above rates include bed and breakfast.  
Extra bed: LE 30  
Service tax: 12%  
Discount available for groups.

### Exercise 16 Let's check

- How many types of rooms are there at the Sun Hotel?
- What is the difference between a single room and a double room?
- What is the smallest kind of room?
- What is the rate for a suite at the Sun Hotel?
- How much does a guest pay for an extra bed?
- How much is the service tax at the Sun Hotel?

### Exercise 17 What do we get?

List A gives some types of service you can get at the Sun Hotel. List B explains them. Match the service to the right description. One of them is done for you.

- | A                     | B  |
|-----------------------|--|
| (a) bed only          | 1 You get a room, breakfast, lunch and dinner.         |
| (b) half board        | 2 You get a room and breakfast only.                   |
| (c) full board        | 3 You get a bed only.                                  |
| (d) bed and breakfast | 4 You get a bed, breakfast and either lunch or dinner. |
-

## Exercise 18 Reading practice

Read this information about a conference.

On 22.11.90 there will be an International Health Conference at the Sun Hotel. The organizers are the International Medical Association, 42 Moore Road, Los Angeles, U.S.A. Their telephone number is 43619841. Their telex number is IM 3941. The event will last for five days, and there will be six V.I.P.s, 180 international delegates, 50 local delegates and 34 accompanying persons.

The conference requires 6 suites, 68 doubles, 50 singles and 48 twins. These must all be full board, and a banquet is also required.

The conference will need 5 meeting rooms, 6 blackboards, 12 microphones with loudspeakers, 6 overhead projectors, 1 slide projector, 6 projector screens, 230 earphones, a video set and camera, 9 TVs, 7 tape recorders, a photocopier, a computer, 6 typewriters, a telex machine and simultaneous interpretation equipment (4).

The conference will need these staff: typists, photographers, guides and equipment supervisors.

## Exercise 19 Let's check

Use the information in Exercise 18 to fill in this form.

THE SUN HOTEL Conference form			
<b>1 Type of event:</b>			
Conference	<input type="checkbox"/>	Workshop	<input type="checkbox"/>
Seminar	<input type="checkbox"/>	Exhibition	<input type="checkbox"/>
<b>2 Organiser:</b>			
Name: .....			
Address: .....			
<b>3 Date of event:</b> .....		<b>4 Duration of event:</b> .....	
<b>5 Number of people attending:</b>			
V.I.P. / Guests of honour .....		Accompanying persons .....	
International delegates .....		Other .....	
Local delegates .....			
<b>6 Number of rooms required:</b>			
Suites .....		Single .....	
Double .....		Twin .....	
<b>7 Food arrangements:</b>			
bed only	<input type="checkbox"/>	full board	<input type="checkbox"/>
bed and breakfast	<input type="checkbox"/>	banquet	<input type="checkbox"/>
half board	<input type="checkbox"/>		
<b>8 Facilities and equipment (write number required):</b>			
conference hall .....		video sets .....	
group work / meeting rooms .....		video cameras .....	
blackboards .....		T.V. monitors .....	
microphones .....		tape recorders .....	
loudspeakers .....		photocopiers .....	
overhead projectors .....		computers .....	
slide projectors .....		typewriters .....	
film projector .....		telexes .....	
projector screens .....		simultaneous	
earphones .....		interpretation equipment .....	
<b>9 Personnel required (write number required):</b>			
typists	<input type="checkbox"/>	equipment supervisors	<input type="checkbox"/>
stenographers	<input type="checkbox"/>	guides	<input type="checkbox"/>
photographers	<input type="checkbox"/>	interpreters	<input type="checkbox"/>

**20**, The written script of the Arabic language unites the world of Islam. Arabic calligraphy is considered very beautiful by the whole world, both Islamic and non-Islamic. Of course, there are many different scripts which the Arabic calligrapher can use. Three well-known examples which you will immediately  
5 recognize are *Kufic*, *Thuluth* and *Riq'ah*.

Kufic

كوفي

Thuluth

ثلث

Riq'ah

رعة

But did you know that English also has many different scripts? Perhaps they are not so important in English nowadays as different  
10 scripts are in Arabic. Calligraphy is probably the most important form of art for Muslims. It is seen not only in the Qur'an and in books, but  
15 also in many other places. It is used, for example, for the decoration of buildings. There are wall-hangings, framed samples and inscriptions  
20 inside and outside public and private buildings. In the western world, the art of calligraphy declined with the introduction of printing and  
25 typewriters. However, it is now becoming more popular again and calligraphers are in demand to illustrate books, posters, cards, letterheads and  
30 many other things.