

Chapter 1: Introduction

1.1 Introduction

Over and over we see students graduated with high scores from their secondary schools, hoping to join a prestigious university, studying subjects of their interests, yet failing to cope with kind of work required in such institution. The confidence they gained when they have been accepted to join university goes in vain. While all students have been accepted upon a fixed criteria set by the board of the university, the levels of success in assessments after the first year vary greatly among them. Upon entering they are all high achievers, nevertheless, after first year we have high, average and low achievers. This problem has been the concern of many researchers in education like (Albaili 1997; Curley et al. 1987; Everson & Tobias 2000; McCormick 2003; Pressley et al. 1998). They all have been investigating the university students studying practices, their learning styles, their educational backgrounds, their socioeconomic status, their emotional development, and many other aspects they may affect their performance at university. A university degree has lifelong effects on the students as citizens in the community. It has effects on their advances in life. The Organization for Economic Co-operation and Development (OECD) (2013) has reinforced the impact of literacy skills on the educational attainment of the individuals that, in turn, has a substantial effect on earnings. In the same context, OECD (2013) has concluded that literacy skills have great impacts on health outcome such as longevity and healthy habits, and also on public and civic participation of individuals.

"Metacognition" is broadly defined as thinking about one's own cognition (Livingston 1997). Metacognition refers to higher order thinking that involves awareness and active control over the cognitive processes engaged in learning. Activities such as planning how to approach a given learning task, monitoring comprehension, and evaluating progress toward the completion of a task are metacognitive in nature. Because

metacognition plays a critical role in successful learning, it is important to study metacognitive activity and development to determine how students can be taught to better recruit their cognitive resources.

Metacognitive experiences involve the use of metacognitive strategies or metacognitive regulation (Brown 1978). For example, after reading a text a learner may question oneself about the ideas introduced in each paragraph. The cognitive goal here is to understand the text. Self-questioning is a common metacognitive comprehension monitoring strategy (King 1992). If learner concludes that answers for one's own questions cannot be found, or that comprehension the material discussed is not achieved, one must, then determine what needs to be done to ensure that the cognitive goal of understanding the text is met. The learner may decide to go back and re-read the paragraph with the goal of being able to answer the questions generated before or while reading. The process of detecting the problem, deciding on the remedial action, selecting strategies to employ, and evaluating the level of understanding as a goal or an outcome of the reading task is metacognitive awareness and regulation of the cognitive behavior while reading.

Furthermore, metacognitive and cognitive strategies may overlap in that the same strategy, such as questioning, could be regarded as either a cognitive or a metacognitive strategy depending on what the purpose from using that strategy. For example, you may use a mapping strategy while reading as a means for summarizing the content in a visual-easy-to-access representation (cognitive), or as a way of monitoring your understanding of what you have read (metacognitive). Because cognitive and metacognitive strategies are closely interwoven and both are equally important for learning to happen, any examination of students' learning and cognition without acknowledging both will not be representative and accurate (Livingston 1997).

The conceptual differences between active learner, and self-regulated learner are out of the scope of this study. Therefore, the two terms are used freely under the broad meaning of successful learner who can manipulate cognitive and metacognitive strategies to achieve academic goals of the task successfully.

1.2 Study Rationale and Significance

The worldwide interest in ways to enhance literacy instruction to integrate metacognitive strategies with theory-based decoding and comprehension strategies has greatly influenced recent studies on students' studying skills and metacognitive awareness. This motivated us to explore the metacognitive awareness level of reading strategies among university students in UAE. We chose the first year students to see their initial level of metacognitive awareness and their reading practices for academic purposes that they carry with them at the doors of the university experience.

This study is carried out in one of the international university campuses in UAE. A cross sectional survey was held to explore the level of metacognitive awareness of academic reading strategies of the new students. A self-report measure: Metacognitive Awareness of Reading Strategies Survey (MARSI) developed by Mokhtari and Reichard (2002), was used for the students to reveal what they know and what they don't know and how frequent they use the strategies they know. Then, a random sample representing an entry psychology class was drawn from the larger sample and further investigated to examine their actual practices while reading compared to their self-reported results. The results are analyzed quantitatively to draw a picture about the students' strengths and weaknesses in regards of their awareness and practices of academic reading strategies.

The purpose of this study is to collect data about the freshmen university students in UAE academic context and their level of metacognitive awareness of reading strategies. Exploring their weaknesses and strengths in awareness and regulation of cognition while reading will benefit stakeholders in patronizing and investing in the design and teaching of targeted instruction programs that foster students' success in university through raising metacognitive awareness.

The results would shed light on the academic context in UAE and the academic needs of the students in the area of metacognitive awareness of reading strategies. This study would promote for future investigations of the population of local and expat university students in UAE, and their metacognition in different domains and across different educational and cultural backgrounds. The results of this study would add to the body of knowledge of tertiary instruction programs of cognitive and metacognitive

reading strategies. The results of this study would inform instruction in academic support programs in higher education, as well as teaching reading strategies in secondary schools to well prepare students for university requirements in academic reading and writing. It is important also for policy makers to identify what is affecting the students' attainment in higher education so that they would implement policies to foster strategic reading instruction in schools and in universities. All stakeholders, educators, researchers, policy makers, and most importantly students can well benefit from this research to develop a strategic reader and a lifelong problem solver for 21st century labor market.

1.3 Statement of Problem

College studying has been widely and extensively researched and analyzed in a quest to find a better system to support higher education students to succeed in an environment that should've been an extension to schooling, but in reality, it is totally different and sometimes overwhelming to many students. The reason is that success in university is not only about what to know but also about how to know it and what to do with this knowledge. Hence, a large portion of the research on higher education is dedicated to develop a repertoire of study strategies for academic success (e.g. Caverly et al. 2000; Holschuh & Aultman 2009; Weinstein & Mayer 1986).

Reading constitutes the basic activity for university students for knowledge acquisition and skills refinement for latter employability. Academic reading differs from reading for other purposes like for leisure or reading instructions. It involves cognitive and metacognitive processes for remembering and comprehension (Baker & Brown 1984). The awareness and regulation of these processes and strategies necessary for achieving academic goal of reading have been the focus of many tertiary programs. Some institutions have comprehensive programs to support freshman learning. Some host reading and writing workshops for new students. Others have a dedicated unit to support teaching and learning in campus.

Our main focus in this study falls into the cognitive and metacognitive factors that influence students' attainment. Paris, Wasik, and Westhuizen (1988) conclude that academic success in higher education needs well-developed metacognitive strategies of the students. Nevertheless, students show a significant deficiency in this area as Pintrich (2002, p. 223) contends, "In our work with college students we are continually surprised at the number of students who come to college having very little metacognitive knowledge, knowledge about different strategies, different cognitive tasks, and particularly, accurate knowledge about themselves". The evident importance of cognitive and metacognitive strategies' instruction is the driving motive behind this study.

Differences between genders in their metacognitive awareness and regulation ability have been discussed in many studies. It has been found that there is no significant difference between both genders (Pintrich & DeGroot 1990; Poole 2005). However, Downing et al. (2008) and Zimmerman & Martinez-Pons (1990) found that female students surpassed their male counterparts in using self-regulated learning strategies. In this study, it is hypothesized that gender differences are not affecting the students' level of metacognitive awareness.

It is pertinent, when examining the academic population in UAE, to shed light on the educational background of the university students in its campuses. As they not only carry various nationalities but also spent their schooling years in miscellaneous educational systems. Therefore, counting for the effect of the educational background of the students on their level of metacognitive awareness is imperative. It is hypothesized that this variable has an effect on their awareness.

Further, we explore the metacognitive awareness of the freshmen university students and whether or not it is consistent with their actual practices in an academic context. Intriguingly, Phifer and Glover (1982) alerted researchers that the students' perceived use of metacognitive strategies might differ from their actual use. They argued that students didn't employ the strategies consistently when they undertook a task. Generally, self-report measures reflect the learners' own perceptions rather than their actual metacognitive activities (Winne & Perry 2000). That is the reason why we further investigated the students instead of taking their words for what they do.

The population of the new university students in U.A.E., both national and international students, is almost never been surveyed to report their needs in regards of their academic reading skills. Needless to say that it rarely and unsystematically experienced direct instruction of metacognitive reading strategies. One of the aims of this research is to open doors for future researches on this population metacognitive awareness and the impact of instruction of reading strategies on the students' academic performances in universities and their development as lifelong learners.

1.4 Research Questions

1.4.1 Phase I Question and Hypotheses

1- What is the level of metacognitive awareness of academic reading strategies of the new university students?

a) Null Hypothesis:

H_{0i} = There is no difference in the level of metacognitive awareness between male and female students.

Hypothesis:

H_{Ai} = There is some difference in the level of metacognitive awareness between male and female students.

b) Null Hypothesis:

H_{0ii} = There are no differences in level of metacognitive awareness among students according to their educational backgrounds.

Hypothesis:

H_{Aii} = There are differences in level of metacognitive awareness among students according to their educational backgrounds.

1.4.2 Phase II Question and Hypothesis

2- Is there consistency between self-reported results and the students' actual practices?

Null Hypothesis:

H_{0x} = There are no differences between the students' reported strategy use and their actual strategy use while reading.

Hypothesis:

H_{Ax} = There are some differences between the students' reported strategy use and their actual strategy use while reading.

1.5 Structure of Dissertation

The dissertation is divided into five chapters, starting with an introduction where the problem is stated and the hypotheses examined in this study are laid out.

Chapter 2 introduces the theoretical framework for this study. It puts forth the fields of metacognition and reading. And it sheds light on their common arenas in order to show where the study stands and how it is adding to the body of knowledge about metacognition and reading strategies. It also discusses a critical issue that is metacognition assessment methodological issues.

In chapter 3, the study itself is described in details to facilitate replication and further investigation for future studies.

In chapter 4 and 5, the findings are presented followed by a discussion and conclusion about their theoretical and empirical implications. Then limitations of the study are put forth followed by recommendations for future investigation.

Chapter 2: Literature Review

2.1 Metacognition Conceptual Framework

The first signs of metacognition emerged near the end of the nineteenth century when William James (1840-1910) wrote a chapter called “ study of the mind from within” in his book ‘The Principles of Psychology’ in 1890. Since then, research on metacognition defined as knowing about what one knows, and about learning process has been brought into focus. Chadwick (1988) proposes that the consciousness of one’s own learning process, actually improves it. The term ‘ meta cognition’ has been first introduced in Flavell’s classic article ‘Meta Cognitive Aspects Of Problem Solving’ (1976). Flavell (1979) and Brown (1987) have expounded metacognition into knowledge about cognition and regulation of the same. The knowledge part includes declarative, procedural and conditional levels of awareness. Declarative knowledge is to know about tasks and strategies to perform. Procedural knowledge is to know how to use the strategies to perform the task in hand. Conditional knowledge is to know when to recruit a certain strategy and the rationale behind that. The regulation part includes planning, monitoring and evaluation processes to regulate learning.

Baker (1989), Brown (1987), Flavell (1987), and Jacobs and Paris (1987) have theorized that the two components of metacognition are related. Schraw and Dennison (1994) held an exploratory experiment for undergraduates of introductory educational psychology course to address the statistical relationship between knowledge of cognition corresponded to what students know about their own thinking, strategies, and conditions under which the strategies are most useful, and regulation of cognition corresponded to how the students plan, and implement strategies as well as how they monitor their learning. They found that these two factors are strongly correlated. Pintrich and DeGroot (1990) found that awareness of strategies was related to self-reported use. Sperling, Howard, and DuBois (2004), as well as Young and fry (2008) have reached similar results.

Pressley et al. (1987) have set forth the complexity and overlapping

properties of cognition and metacognition when describing the ‘good strategy user’ as an individual who comprehends the nature and practices involved in effective learning such as activating prior relevant knowledge, allocating resources appropriate to the task, making decisions about selection of strategies, monitor the effectiveness of the process and evaluate the outcomes periodically, and motivating oneself to reach deeper level of understanding.

Schraw and Moshman (1995) propose that individuals possess cognitive structures or sets of ‘metacognitive theories’ to enable them to employ the knowledge and skills beyond the context in which they were learnt. They explain that the individual builds one’s own body of metacognitive theories based on knowledge, experiences, and objectives, and that this cognitive structure can help planning and monitoring future behavior in similar contexts. This corresponds to Flavell (1979, p.3) description of cognitive monitoring processes as an interaction among four interrelated domains: “metacognitive knowledge, metacognitive experiences, goals (or tasks), and actions (or strategies).”

Within the framework of metacognition, lays a fundamental conception that metacognition should be considered as means of thinking and reaching learning objectives. It is a cognitive tool in itself rather than a goal. Paris and Winograd (1990) emphasize this idea by describing metacognition: “ as a functional means to learning rather than a goal in itself. Metacognition is embedded in ongoing thinking and problem solving and is an intermediate step to proficiency. Metacognition can provide students with knowledge and confidence that enables them to manage their own learning and empowers them to be inquisitive and persistent in their pursuits.” Paris and Winograd (1990, p.9)

Study skills intervention programs have been scrutinized by Hattie, Biggs, and Prudie (1996) in order to determine the successful ones that have larger effect size on students’ attainment and the conditions for those programs to make difference. They concluded that instruction should be a) contextual, b) domain specific, c) promote the learner’s metacognitive awareness, and d) relate the strategy to the task in hand. This conclusion fits what Haller, Child, and Walberg (1988) have done when they meta-analyzed 20 studies from 1975 till 1987 about metacognitive instruction in reading skills

and found an average effect size of 0.71. Bransford, Brown, and Cocking (1999, p.78) concur that teaching metacognition to students facilitates knowledge transfer by making them in control of their cognitive behavior and understanding, and allows them “to keep learning adaptive expertise.” Recently, Hattie (2009) examined the effect of teaching study skills to students on their performance and reported the effect size as $d= 0.59$. He also found the effect size of metacognitive strategies instruction on student’s achievement to be $d= 0.69$.

Apparently, metacognition is an unconscious cognitive process that can be brought to consciousness by explicit instruction and training so as to develop a skill to monitor and control own cognition called metacognitive skill. Researches have indicated that learners with higher level of metacognitive awareness are more strategic and perform better than the unaware ones (Pressley & Ghatala 1990; Swanson 1990). They show that differences in strategy use and performance are related to differences in metacognitive awareness rather than differences in intellectual aptitude. Schraw and Dennison (1994) found that students who scored high on the knowledge of cognition factor also scored high on the reading comprehension test, but scored low on the regulation factor. Although, they highlighted the importance of their finding that knowledge and regulation of cognition are highly inter- correlated, they suggested that knowledge could develop independently of the regulation. They contended that the regulation of cognition processes occur at a much deeper level and in an automated way that it is difficult to detect and measure. This explanation concurs with Brown (1987) conclusion that the consciousness of the regulatory practices couldn’t be measured accurately or addressed by the individual in a clear, definite way. She suggests that those practices are highly automated that even adults cannot identify them while performing.

Many theorists believe that metacognitive knowledge is progressive. It shows early signs in childhood and continues to develop (Brown 1987; Flavell 1987). Baker (1989) found that adults tended to be more aware of their own cognition than young children and were more able to state the activities they knew (declarative knowledge) and used (procedural and conditional knowledge). Garner (1987), and Schneider and Pressley (1989) show that effective learners appear to have more knowledge about their own cognition and how their memory works and are more likely

than poor learners to use what they do know.

Maturity and experience also affect the selection of strategies and the decision about their adequacy to the task in hand. Lorch, Lorch, and Klusewitz (1993) found that college students could differentiate among the information processing demands of ten reading situations and employ the appropriate strategy for each situation in order to regulate their learning and reach their goals.

Furthermore, the relationship between metacognition (awareness and regulation) and academic success has been extensively explored. High achieving students are found to be more accurate at predicting their test results, to set more realistic goals for their learning, and to be more effective in implementing strategies (Isaacson & Fujita 2006; McCormick 2003). Garner and Alexander (1989) found that more experienced learners were more aware of their cognition and more able to use their knowledge to regulate their learning and to plan for upcoming tasks regardless of the content. Similarly, higher achieving students use more learning strategies than do lower achieving students (Schraw & Dennison 1994; Zimmerman & Martinez-Pons 1990). Garcia and Pintrich (1994) concluded from their large-scale study at the University of Michigan that students who were engaged in deeper levels of cognitive regulation, such as elaboration and organization, were more likely to do academically better.

2.2 Assessing Metacognition

Assessing metacognition has been the focus of many studies for over 20 years. Researchers have been facing many challenges trying to measure metacognition. They keep developing new tools and assessments, either direct or indirect, to grasp cues of the planning-monitoring-evaluating process to draw an empirical-based picture for it, and to inform instruction as well as future research.

Tools such as questionnaires (Pintrich & deGroot 1990; Thomas 2003), interviews (Zimmerman & Martinez-Pons 1990), analysis of thinking-aloud protocols (Afflerbach 2000), observations (Veenman & Spaans 2005), stimulated recall (Van Hout-Wolters 2000), on-line computer-log file registration (Veenman et al. 2004), and eye-movement registration (Kinnunen & Vauras 1995). All these assessment techniques have their pros and cons. And the results are mixed due to the many variables that interfere with cognition, such as intrinsic motivation, and prior knowledge of the content. As an example of those studies, King (1991) examined fifth-grade students who used a self-report checklist outperformed control students on a number of measures, including written problem solving, asking strategic questions, and elaborating information. King found that using explicit forms of assessing concurrent cognitive activities such as checklists help students to be more strategic and systematic when solving problems.

Veenman (2005) classifies the methods for measuring metacognition into prospective if it is implemented before the task, simultaneous if it is implemented during the task, and retrospective if it is implemented after the task.

Simultaneous measurements of metacognition, also called synchronic or concurrent methods such as think-aloud, computer log files allow students to describe their metacognitive activities online while solving a certain problem. These methods are quite appropriate to collect data from the students directly without any delay and in their own wordings about their cognitive and metacognitive behaviors while processing a text. However, they may interrupt the problem solving process and may disrupt the learning, as the students' focus will shift to verbalizing their behavior (Caldwell & Leslie 2010). Moreover, these measurements require extensive time to evaluate students individually. Add to that the concerns regarding the validity of the results because such methods are

only applicable in a laboratory setting rather than a natural learning setting in the classroom (Scott 2008).

The measures that are mostly used in prospective and retrospective investigation of metacognitive behavior are questionnaires and interviews or stimulated recalls. Questionnaires can easily be administered to larger sample of students and within the classroom environment with minimal researcher interference (Tobias & Everson 1997). Moreover, students have the freedom to express their opinions, and/or expectations about their metacognitive behavior without confronting the investigator or revealing their identity. This puts them at great comfort and encourages their active participation in the investigation. Additionally, questionnaires attain equality for all participants in the data collection. Finally, questionnaires are reliable and effective in certain structures where it is difficult to measure overt behavior such as observing motivation, and cognitive engagement (Pintrich & DeGroot 1990). However, the down side of questionnaires could be that students may misunderstand some of the questions or simply, answer at one extreme of the scale. For example, students may perceive 5 on a Likert-scale as a representative of the best behavior and they tend to choose it all through the questionnaire. In metacognition, students may over estimate their awareness or regulatory behavior in pre task questionnaire or they may not recall all their activities while performing the task in a retrospective report.

Interviews provide an in-depth examination of the students' behavior. They are more interactive. They give the students an opportunity to elaborate and expand in their answers instead of limited "yes" or "no" answers or rating their behavior on a Likert-scale. Nevertheless, they suffer from the same limitations that constrain think-aloud methods. They are time consuming and limited to laboratory setting (Scott 2008).

Similarly, self-report questionnaires have been criticized in the literature for they merely reflect student's own perception of strategy use that may differ from the actual behavior (Braten & Samuelstuen 2004; Richardson 2004). Veenman (2005, p.13) has concluded, "Generally speaking, people simply don't do what they say they will do, or they do not recollect accurately what they have done".

Schraw (2001) has emphasized that using a single method to capture the complex nature of metacognition and quantify it in a measurement and a score is

unrealistic. Highlighting the same point, Tobias and Everson (2002) suggest that to measure an aspect of metacognitive behavior observations, interviews, and individual self reports should be administrated to collect enough data to draw inferences and connections. Furthermore, Sperling et al. (2002), Veenman (2005), Cromley & Azevedo (2006), and Merchie & VanKeer (2014) have all adopted the multiple methods approach to collect data about metacognition. Azevedo (2009, p.93) summed the issue up in saying that “[c]onverging multiple sources of data is key to developing a comprehensive understanding of the underlying metacognitive and self regulatory processes”.

In Summary, the components of metacognition are interrelated and are an essential tool for effective learning to take place. Although, some cognitive and metacognitive processes are more subtle and difficult to measure than others, evidences of their occurrence show in students’ behavior and performance while executing learning tasks and this is measurable. However, endeavors to find a comprehensive and effective tool to assess metacognition are in an on-going progression.

2.3 Metacognition & Reading

Baker and Brown (1984, p.49) assert, “metacognition plays a vital role in reading”. The term metacognition refers to one’s awareness and control of any cognitive process. Metacognition in the context of reading is usually considered to consist of two types: first, one’s knowledge of strategies for learning from texts, and second, the control readers have of their own behavior while reading for different purposes. Successful readers monitor their progression and comprehension while reading and the state of their learning as an outcome. They plan before reading, decide on the strategies to be employed, adjust effort according to the emergent situations or difficulties, and evaluate the success of their ongoing efforts to develop meaning (Baker & Brown 1984).

Recent theories of reading comprehension characterize efficient readers by being strategic or “constructively responsive” readers who skillfully coordinate cognitive resources when reading (Pressley & Afflerbach 1995). The metacognitive role lays in the awareness of these resources, the how and when to use, the decision to choose one or more and to monitor the comprehension process for proceeding or taking remedial actions to fix any detected error, and ultimately evaluate the process as a whole to decide whether or not to replicate it in other similar reading situations.

According to Baker and Brown (1984), strategy selection process depends on the goal from reading, whether the goal is to recall as in studying or meaning making. They emphasize that the main goal of reading activity should be comprehension or meaning-making as this is where all the cognitive and metacognitive skills occur, causing learning to happen. The strategies used by the reader to memorize a text are basically rehearsal strategies such as using mnemonics, underlining, highlighting where the learner needs to demonstrate knowledge of content and recall information by rote. On the other hand, when the goal is constructing valid meaning of the text and synthesizing the information introduced into creative ideas for new situations, the reader has to use different set of reading strategies, mostly problem solving strategies. Comprehension sets challenges for the reader. When the flow of the comprehension process is obstructed, remedial actions should be taken. The choice of the appropriate strategy to solve the problem in hand, such as difficult vocabulary, inconsistency in sentences, contradictory

ideas, define the quality of the reader metacognitive awareness of reading strategies (Baker & Brown, 1989). Comprehension induces the reader to dig deeper in the text and use deep learning strategies, and therefore, promotes for lifelong learning. Good readers are more aware of the strategies they use than poor readers and choose their strategies in light of their purposes set before reading (Martin 1994; Spedding and Chan 1993). Beckman (2002) suggests that identifying the most effective one of these strategies depends on the needs of the learner and the requirements of the task. Similarly, Van-Duzer (1999) postulates that good readers are capable of choosing and using a variety of strategies depending on the task. Alderman (1999) adds that an awareness of the task goal directs students' attention and action toward a certain target, helps them to assemble their resources toward the accomplishment of this goal and to develop plans and strategies to reach this goal. Furthermore, Knutson (1998) concludes that goal setting enhances readers' interest and performance. Schunk and Zimmerman (2003) confirms the same idea that setting a goal beforehand, specially if it is set by the learner himself, motivates the students to learn better from the task and to keep solving problems until the goal is reached and the task is done.

Nevertheless, further research on college readers postulates that efficient strategic behavior requires more than the awareness of the proper strategies, as it results when the reader understands how a strategy works, as well as when and where to apply it for the most effective results. Paris and Winograd (1990) used an analog to better describe the strategic reader. They resembled the strategic reader to a craftsman who not only knew his toolbox, but also understood the appropriate usage of each and every tool in it. He could easily and skillfully make decision on how to fix any problem. Kletzien (1992) found that poor readers knew the same number and type of strategies as good readers. However, their use of these strategies was far less effective and less regulated than that of the good readers. Strategic readers are more flexible in strategy use and in monitoring its effectiveness than non-strategic readers (Loranger 1994; Wang and Guthrie 1997). After adequate classroom instruction and practice, the use of strategic processes should eventually become a natural part of reading behavior or skill (Alexander et al. 1997). Students who understand an array of strategic processes and make use of

these abilities usually achieve more in academic settings than those who understand and use fewer strategic processes.

Metacognitive control, in which the reader consciously directs the reasoning process, is a particularly important aspect of strategic reading. When readers are conscious of the reasoning involved, they can access and apply that reasoning to similar reading in future situations (Duffy et al. 1987). In their model of good strategy user, Pressley and Afflerbach (1995) contend that a skilled reader should be ‘conscious’ and in control of effective strategies, and that explicit instruction can teach readers how to keep track of their performance and monitor their progress towards their cognitive goals. They further explain that a skilled reader rarely uses monitoring strategies in isolation. Instead, skilled reader uses them in sequence with other cognitive strategies to achieve a strategic goal from reading. Examining metacognitive monitoring while reading is not a new field in research. In fact, Thorndike (1917, p.327) was describing lack of self-monitoring of comprehension when argued that, “the vice of the poor reader is to say the words to him self without actively making judgments concerning what they reveal”.

There have been several trends in measuring metacognitive reading skills, such as introspective reports collected from adults and recall protocols (Baker & Cerro 2000); self-reports during reading; online think-aloud protocol (Magliano & Millis 2003; Pressley & Afflerbach 1995); retrospective self-reports (Mokhtari & Reichard 2002). They all agree that one measure is not enough to collect reliable data about metacognition and reading activities.

2.4 Research-validated Reading Strategies

Alexander and Judy (1988, p.376) define strategies as “goal-directed procedures that are plan-fully and intentionally evoked ...(to) aid in the regulation, execution, or evaluation of task”. Alexander et al. (1998), as well as Paris, Wasik and Turner (1996), differentiate strategies from skills. Skills are automatized strategies, and are evoked by the task requirement without the readers been consciously making decisions about selection or deployment. Alexander et al. (1998) define skills as essential academic habits that have become routinized, automatic procedures. Alexander and Jetton (2000) describe strategies by being procedural, purposeful, effortful, willful, essential, and facilitative.

The importance of effective cognitive strategies is in their direct promotion of learning and comprehension. Garner (1987) has described effective strategies by these that engage students in activities that lead to understanding, knowledge acquisition, or ‘making cognitive progress’ and further categorized them into deep and surface approaches to learning.

Deep and surface approaches to learning are identified as a result of students’ perceptions of academic tasks (Biggs 1999). Students who adopt deep approaches to learning tend to personalize academic tasks and integrate information so that they can see relationships among ideas (Entwistle & Ramsden 1983). Deep approaches to learning allow the learner to build on previous knowledge in a meaningful way that facilitates long-term learning (Marton & Saljo 1997). These students are more successful at both selecting strategies and monitoring when facing reading difficulties such as inconsistency or new vocabulary or grammatical errors (Nist & Holschuh 2000).

On the other hand, students who adopt surface approaches begin a task with the sole purpose of task completion rather than learning, which leads to the use of memorization strategies (Entwistle & Ramsden 1983; Marton & Saljo 1997). Surface approaches can also hinder learning because when students do not use strategies that facilitate integration of information, they may reach a point where they are unable to grasp new content and they are risking forgetfulness when recall is required (Holschuh & Aultman 2009).

Educators have listed cognitive and metacognitive strategies that can be used to facilitate adopting deeper learning approaches, and ensure readers' comprehension. These strategies include: activating prior knowledge, anticipating information, questioning, visualizing, inferring, scanning, summarizing, synthesizing, analyzing, paraphrasing, making connections, chunking, underlining, using mnemonics and others.

Nist and Simpson (2000) suggest that students should be taught research-validated strategies. They examined a variety of researches to find four strategies that most researchers agree on their effectiveness, especially, in high school and college context. They stress that the effectiveness of these four strategies is subject to the domains where they are applied and the tasks nature and goals. The strategies are summarization, generating questions, schematization, and elaborations. These effective strategies promote deep understanding and learning of the content.

Summarization is a type of rehearsal activities that requires the reader to isolate key information and paraphrase it in learner's own words. Although, Schunk and Zimmerman (2003) contend that summarization is an effective strategy limited to tasks requiring memorization, Brown and Day (1983), and King (1992) argue that it implies that students are actively reading and monitoring their comprehension. When students meet information that they cannot put into their own words, they know then that there is a breakage in the comprehension process, and start to initiate a detection process to identify the problem and develop remedial measures to recover comprehension. It also encourages students to actively construct ideas and making connections to what they know. However, for students to develop good summarizing strategy application and to show cognitive progress when using this strategy, enough time, practice, scaffolding and feedback should be allowed to happen (Nist & Simpson 2000). Schunk and Zimmerman (2003) assert that underlining or highlighting is another popular and effective rehearsal strategy for memorization. Nevertheless, it loses its effectiveness when it is done redundantly or irrelevantly. In other words, when too many ideas or unimportant ideas are underlined, or key ideas are missed, then the strategy loses its purpose (Snowman 1984). Similar situation could happen with summaries when they get filled with redundant or

unnecessary information, summarization as a strategy loses its point and distracts learning process (Snowman 1984).

Questioning is a way to elaborate on information, from prompting the retrieval of prior knowledge and focusing attention to checking comprehension of information and predicting possible test items. Some texts provide the question to arouse the readers' curiosity and motivate them to continue reading. Others leave the job for the readers to generate their own questions according to their individual experiences and expectations. In academic context, self-questioning strategy is found to improve comprehension and performance on exams (King 1992; Taraban et al. 2004). Some educators argue that self-questioning is a more effective strategy for comprehension monitoring than passive strategies like rereading or rehearsal, specially if these strategies only reflect the verbatim information from the text. Questioning, on the other hand, encourages the reader to read with a purpose to find the answer, to evaluate the possible answers for the questions, and think whether or not the text is a sufficient source. This type of cognitive and metacognitive engagement enhances deep learning. Pre-reading questioning can be motivating for students because they are approaching the text with a purpose (Nist & Holschuh 2000).

Schematization or mapping helps students organize the information so that they can see links between the main points and supporting details. It improves students' awareness of structure. It involves isolating key information and mapping it to visualize the relationships in the text that enhances the students' ability to integrate new knowledge into a coherent structure (Lipson 1995). Any discrepancy between the ideas proposed by the author could be easily detected, and then the students could see whether those ideas are sufficiently supported by evidence or not, or may be detect a flaw in the map itself to be fixed. Mapping has been found more useful when the texts are more complex and the students are asked to demonstrate their understanding on measures of higher order thinking levels such as synthesizing and production (Armbruster & Anderson 1980).

Likewise, elaboration induces learning to develop at a deeper level. Drawing inferences and creating analogies or relating the new information to personal examples are all forms of effective elaboration process. This self-generated process

motivates students to personalize their learning experiences and make them more relevant.

Research has indicated that many students encounter difficulty in isolating important material and that leads to academic failure and frustration (Nist & Simpson 2000). Effective cognitive operations push the learning process to go to deeper level leading later on to produce creative genuine ideas. Students engaged in deeper information processing are more likely to achieve more academically and to be more motivated to learn (Pintrich & Garcia 1991).

The metacognitive aspect of using these reading strategies lays in knowing them (declarative), how and when to use them, and their suitability for the task demands or goals (procedural), and the reason behind using them in that specific task (conditional). Also, it declares itself in self-monitoring while application of strategies, and in evaluating the comprehension or remembering as a product of strategic reading (Baker & Brown 1984). Metacognitive reading strategy refers to goal-directed cognitive processes and behavior that control and adjust the reader's attempts to comprehend a text (Afflerbach et al. 2008).

Researchers consensus that a skilled reader is highly aware of his own cognition and the tactics exercised while reading are periodically monitored to regulate comprehension and achieve strategic goals from reading (Pressley & Afflerbach 1995; Alexander & Jetton 2000). Paris and Jacobs (1984) described skilled readers by being engaged deliberately in cognitive and metacognitive activities and self-monitoring, whereas poor readers seemed to use some of the strategies unknowingly and without exercising any control on their reading progression. Snow et al. (1998) concluded that strategic readers understood the text literally and also could draw inferences that were valid. Furthermore, Pressley & Afflerbach (1995) point out that strategic readers approach their reading tasks with awareness of the task goals, a tentative plan of the necessary strategies to solve potential problems, and a tendency to monitor the fluency of the stream of ideas presented in the text and its assimilation with prior knowledge of the subject. In Contrast, unskilled readers possess relatively less awareness and exercise little monitoring for their comprehension and other cognitive behavior and goals (Baker & Brown 1984; Flavell 1979).

To overcome the problem of low awareness level and lack of control while reading, researchers have found a positive effect of direct instruction of reading strategies (Brown 1987; Brown & Day 1983; Palincsar & Brown 1984). To show the effect of training on metacognition knowledge and regulation, Delclos and Harrington (1991) examined fifth and sixth-grader's ability to solve computer problems. He randomly assigned them to three groups. The first group received a problem solving training. The second received an additional self-monitoring training, while the third didn't receive any training. Although the first group performed well above the third, the second group solved more of the difficult problems than either them and took less time to do so. In the same context, Paris & Jacobs (1984) found a significant increase in children's score in a comprehension test when they were exposed to informed directed instruction about reading strategies and self monitoring activities while reading for comprehension.

In Brief, the research on metacognition and reading strategies is extensive and of multidimensional nature. This body of knowledge has been pertinently important to inform teaching and learning pedagogies. To better assess metacognition, it is recommended to clearly define what and who to study as well as how. This study is going to survey the level of metacognitive awareness of the new university students of academic reading strategies using a self-report measure, and then examine the survey results against the actual strategy use while reading. Six strategies are chosen for the further examination. Three are related to summarization (deletion, generalization, and invention). Deletion stands for the ability to make judgments about what are the key ideas, which is redundant and unnecessary and which is important to include in the summary. Generalization stands for paraphrasing to succinct details. Invention reflects the ability to express understood information in own words. Also, it relates to the ability to activate prior knowledge. The other three strategies are highlighting or underlining, mapping and generating questions.

Chapter 3: THE STUDY

3.1 Method

Measurement of metacognition has always been challenging because the construct of metacognition itself is of complex nature and implies overt and covert behaviors that represent challenges for the researcher to measure.

For the previously stated methodological considerations, multiple methods for data collection have been employed in this study. A cross sectional survey was administered to a representative sample of first year university students to measure their level of metacognitive awareness of reading strategies and the frequency of usage of these strategies while reading their textbooks and assigned readings using MARSII, a self-report measure developed by Mokhtari and Reichard (2002). The results of the self-reported questionnaire are analyzed thoroughly to answer the first question of the research.

Then, a class of entry-level psychology representing a subsample was investigated in depth to examine the relation between their self-report results and their actual practices while reading to study for end of term exam. A demo studying session was held and students were asked to produce a summary of an excerpt from their textbook at the end of that 60-minute-session. The data collected is analyzed quantitatively to answer the second question.

3.2 Design

This study is a quantitative research aiming to explore the metacognitive awareness of reading strategies of the first year students in higher education. For a deeper insight, an investigation of the students' actual practices while reading for academic purposes is planned as a follow up step in the research design. As the self-report

instrument only measures the declarative knowledge (Veenman 2005) of reading strategies, a further investigation was held to examine the actual practices of the students while reading for studying as part of their preparation for end of term II exam. The research is carried out in two phases.

Phase I includes a survey of a random representative sample of new university students. The survey is quantitatively analyzed and discussed. The results of the survey answer the first question of the research:

What is the level of metacognitive awareness of reading strategies of the first year undergraduates?

Phase II includes a demo studying session where a smaller sample randomly drawn from the phase I large sample was handed an excerpt of their textbook and asked to produce a summary of the key ideas in it. The aim of this investigation is to measure whether the students' actual practices while reading for studying are consistent with the self-reported metacognitive awareness level and frequency of use of reading strategies. A quantitative analysis of their practices while reading and of the summaries produced at the end of a demo studying session is carried out to answer second question:

Is there consistency between what the students report doing and what they actually do while reading for academic purposes?

3.3 Participants

In this study, phase I took place during term I on the first two weeks of the academic year 2013-2014. A random sample of entry-level university students (N=169) was surveyed. They all voluntarily approved to fill in the self-report survey. All the students were admitted in the university against the same criteria (scoring 70% or higher on American High School Diploma or equivalent), and their level of English proficiency, if not native speaker, is equivalent to minimum of 5.5 in all categories of IELTS or score 70 on TOEFL. The medium of teaching in university is English. So their proficiency in reading and communicating in English is at native level. Their ages vary

between 16-19 years old. They all spent 12 years of schooling, although they went through different range of curricula. The homogeneity of the sample supports it as a representative sample of first year university students.

The table below summarizes the demographic characteristics and the educational backgrounds of the sample in phase I.

Table1. Summary of participants in phase I.

Gender		Educational System				
Male	Female	India	UK	USA	UAE	Filipina
76	93	99	48	12	8	2
45%	55%	58%	28.4%	7.1%	4.7%	1.2%
Total		169				

Phase II took place in term II. A class of entry psychology (n = 29) was randomly selected from the larger sample to go through further investigation. They are all female students. Only one male was registered in this class but didn't attend on the test day. The table below summarizes the educational backgrounds of the subsample in phase II.

Educational System			
Indian	British	American	Emarati
11	11	3	4

3.4 Instrumentation

In phase I, Metacognitive Awareness of Reading Strategies Inventory (MARSI) was administered to the students. MARSI is a self-report measure that was originally developed by Mokhtari & Reichard (2002) as a tool for measuring adolescents and adults' awareness and use of reading strategies while reading academic or school-related materials. It is a self-report survey instrument where the students should rate their cognitive and metacognitive activities while reading on a Likert scale that ranges from 1 (I never do this) to 5 (I always do this). It is a theory-based instrument that is divided into three sub scales GLOB, PROB, and SUP.

GLOB stands for global reading strategies and measures cognitive processes that occur before and while reading. It contains 13 items. PROB stands for problem solving reading strategies and measures the remedial actions taken by the reader when difficulties in decoding or understanding occur. It contains 8 items. SUP stands for supplementary reading strategies and measures the external or behavioral activities that the reader takes to reach the purpose of the reading. It contains 9 items. MARSI was validated using a large sample ($n=825$), representing students with different levels of reading abilities. The internal consistency reliability coefficients (as determined by Cronbach's alpha) for its three subscales were as follows: GLOB (0.92), PROB (0.79), and SUP (0.87). The overall reliability $\alpha = 0.93$, indicating a dependable measure of metacognitive awareness of reading strategies. A complete description of its psychometric properties as well as its theoretical and research foundations can be found in Mokhtari and Reichard (2002).

The scoring of the questionnaire is based on Oxford 1990 criteria for language learning usage of high = mean of 3.5 or higher, medium = mean of 2.5 to 3.4, and low = mean of 2.4 or lower.

Phase II consists of a demo studying session designed to collect data about the students' actual practices while reading for studying for an upcoming multiple-choice exam at the end of the term. The students were asked to summarize a part of their textbook assigned by their instructor within 60 min. The piece was factual mainly introducing information to be memorized. The data collected was analyzed according to

the three macro-rules for summarization developed by Van Dajik and Kintsch (1978) (see appendix 3). Then effective reading strategies were selected in the light of the verbal protocols of reading developed by Pressley and Afflerbach (1995) (see appendix 2).

The Three macro-rules of summarization:

- 1) Deletion.
- 2) Generalization.
- 3) Invention.

The strategies to remember a text of the constructive responsive reading are:

- 1) Underlining or highlighting.
- 2) Mapping.
- 3) Questioning.

For lack of literature in quantitative methods to compare self-reported (observed) strategies to actual strategies (expected) employed while reading to fulfill the summarization task. Firstly, each expected strategy is paired to an observed strategy on MARS tool.

Number of strategies	Actual strategy (Expected)	Reported strategy (Observed)
1	Deletion	GLOB14
2	Generalization	SUP6
3	Invention	SUP20
4	Underlining	SUP12
5	Mapping	SUP28
6	Questioning	PROB21

Then, a mathematical formula was used to measure the percentage of differences between the observed (a) and the expected (b):

$$[(a - b)/b]*100$$

MARSI instrument, a thumbnail of verbal protocols of reading, scoring criteria, and the excerpt of the psychology textbook are all appended.

3.5 Procedure

In the first two weeks of term I, the MARSI questionnaire was distributed by hand to a random sample of entry-level students. They were asked to read an informing letter about the nature of the research and the survey, then to sign a consent form. They all answered the survey in person. Afterwards, the survey papers were coded for confidentiality and analyzed.

In the second term, a class of entry psychology that already answered the MARSI questionnaire went through a demo studying session to collect data about their actual practices while reading for studying. They were instructed to summarize an excerpt of their textbook assigned by their instructor. They were encouraged to use the SQ3R method and/or any other way they usually use to read for studying. They were instructed to work individually and to produce a summary of the key ideas at the end of the 60-min-session. The session was observed by the researcher to maintain consistency and rigorousness. Then, the excerpt papers collected with all the marking, scribbling, highlighting or any other note making and the summary papers were collected as well for further analysis.

The class was briefly informed about what SQ3R method was and how it could be used for effective reading. They were also given some handouts to explain about some theory-based effective reading strategies such as mapping, questioning, skimming and scanning. That took place for 4 weeks before the demo studying session. The purpose was raising consciousness among students of what are the academic reading strategies and how they should be used. This brief introduction of strategies didn't affect their performance, however it helped them to recall their habitual practices and focus in employing them while reading during the demo session.

3.6 Ethical Considerations

The research has been conducted within the university guidelines for ethics in educational research that revolve around three principles; respect for persons, beneficence, and justice. The research also followed the ethical considerations in data collection such as seeking informed consent, ensuring confidentiality of the participants as well as of the institution that welcomed the research in its campus.

All approvals for access and running the study were sought beforehand. Copy of the consent form for the students is appended.

Chapter 4: Results and Discussion

In this chapter, the data collected across two terms in two phases are reported and analyzed to determine the level of metacognitive awareness of reading strategies among first year undergraduates and to investigate the consistency between their self-reported results and their actual practices in order to inform instruction of academic reading strategies. This chapter is divided in two sections presenting the data collected throughout the two phases. Descriptive statistics are used to report the data in both phases. Inferential statistics and drawing relationships between the variables are out of the scope of this study. However, the inferences and insights that can be drawn from the data are discussed in the next chapter. All tables and charts, included or not in this section, are appended for easier access.

4.1 Phase I Data

4.1.1 Descriptive Statistics

The data collected from the cross sectional survey administered in phase I of the research was quantitatively analyzed to show the frequencies and percentages. Descriptive statistics were used to better explore the metacognitive awareness of reading strategies of freshmen university students. The total number of participants is 169 divided into male = 76 and female = 93 students. The participants came from various educational systems as shown in the table below.

Table 2. Summary of the participants according to their educational backgrounds.

Educational System	Number of Students	Percentage
Indian	99	58.6%
British	48	28.4%
American	12	7.1%
Emarati	8	4.7%
Filipino	2	1.2%

Table 3 shows the performance of the students (N = 169) on MARSII survey. As it shows that the number of students who scored 3.5 or higher is 89 students representing 53.3% of the sample. Meanwhile, the number of students who scored 3.4 – 2.5 is 74 representing 44.4% of the sample. Only 2.3% of the students scored 2.4 or lower.

Table 3. Summary of frequencies and percentages of the participants' performances in MARSI.

MARSI scores	mean	Frequencies	Percent	MARSI scores	mean	Frequencies	Percent
3.5		9	5.3	3.9		3	1.8
3.2		6	3.6	4.0		3	1.8
3.4		6	3.6	4.0		3	1.8
3.3		5	3.0	4.0		3	1.8
3.4		5	3.0	4.1		3	1.8
3.5		5	3.0	2.3		2	1.2
3.7		5	3.0	2.8		2	1.2
3.8		5	3.0	2.9		2	1.2
3.9		5	3.0	3.0		2	1.2
4.2		5	3.0	3.1		2	1.2
3.0		4	2.4	3.5		2	1.2
3.3		4	2.4	4.2		2	1.2
3.3		4	2.4	2.2		1	.6
3.4		4	2.4	2.2		1	.6
3.6		4	2.4	2.4		1	.6
3.6		4	2.4	2.4		1	.6
3.6		4	2.4	2.5		1	.6
4.1		4	2.4	2.6		1	.6
2.8		3	1.8	2.6		1	.6
2.9		3	1.8	2.7		1	.6
3.0		3	1.8	2.7		1	.6
3.1		3	1.8	2.8		1	.6
3.1		3	1.8	2.9		1	.6
3.2		3	1.8	4.1		1	.6
3.2		3	1.8	4.3		1	.6
3.7		3	1.8	4.3		1	.6
3.7		3	1.8	4.4		1	.6
3.8		3	1.8	4.7		1	.6
3.8		3	1.8				
3.9		3	1.8	Total		169	100%

On examining the MARSİ mean scores against the gender variable, there weren't big differences between the male and female students. Male students scored 3.451 and female students scored 3.481. Both came very near to the overall average 3.467.

Table 4. Summary of participants overall mean scores according to gender.

Students	Mean	N	Std. Deviation
Male	3.451	76	.4901
Female	3.481	93	.4699
Total	3.467	169	.4779

On examining the MARSİ mean scores against the educational background variable, there weren't big differences either. Table 3 shows the slight differences in MARSİ mean scores between them.

Table 5. Summary of participants overall mean scores according to their educational backgrounds.

Educational system	Mean	N
Indian	3.448	99
British	3.483	48
American	3.506	12
Emarati	3.537	8
Filippino	3.533	2
Overall MARSİ Mean	3.467	169

MARSİ questionnaire is segregated into 3 subcategories (GLOB, PROB, SUP). When the mean scores of the three subcategories were examined against the gender and the educational systems of the students.

In table 6, male students scored slightly above the female students in global reading strategies, but below them in problem solving strategies and supporting strategies. Generally, they both use problem-solving strategies more often than global reading strategies and supporting reading strategies respectively. Overall the differences between their levels of metacognitive awareness are marginal.

Table 6. Summary of participants’ performances in MARSII according to gender.

Gender		GLOB	PROB	SUP	MARSII
Male	Mean	3.411	3.679	3.306	3.451
	% of Total N	45%	45%	45%	45%
	N	76	76	76	76
Female	Mean	3.386	3.777	3.354	3.481
	% of Total N	55%	55%	55%	55%
	N	93	93	93	93
Total	Mean	3.397	3.733	3.332	3.467

Taking in consideration the differences in number of participants, in table 7 the students who studied the Emarati system are reporting the highest global strategies awareness. The students of the American system show the highest level of awareness of problem solving strategies even higher than the overall average. However, both groups scored almost the same scores across the three subcategories. The Indian and the British systems’ students show close results in global strategies, but the students of the British system surpass their counterparts in the Indian system in problem solving strategies. The students of the Indian system are the only group that scored below the overall mean of the PROB subcategory. There is a receding interest in the usage of the supporting reading strategies such as using references, taking notes, discussing with a friend to check understanding across the groups of participants.

Table 7. Summary of the participants’ performances in MARSII according to educational backgrounds.

Educational system		GLOB	PROB	SUP	MARSII
India	Mean	3.392	3.665	3.337	3.448
	% of Total N	58.6%	58.6%	58.6%	58.6%
	N	99	99	99	99
UK	Mean	3.413	3.797	3.303	3.483
	% of Total N	28.4%	28.4%	28.4%	28.4%
	N	48	48	48	48
USA	Mean	3.353	3.927	3.352	3.506
	% of Total N	7.1%	7.1%	7.1%	7.1%
	N	12	12	12	12
UAE	Mean	3.471	3.859	3.347	3.537
	% of Total N	4.7%	4.7%	4.7%	4.7%
	N	8	8	8	8
Fillipin	Mean	3.269	3.875	3.611	3.533
	% of Total N	1.2%	1.2%	1.2%	1.2%
	N	2	2	2	2
Overall	Mean	3.397	3.733	3.332	3.467

Then, the students’ preferences of strategies were explored. In table 8, the strategies are arranged from most frequently used strategies to least frequently used ones.

The top five strategies are:

1- PROB 27: I reread to increase my understanding.

39% of the participants reported that they usually use this strategy when comprehending a text becomes difficult. Meanwhile, 33% reported that they always use it.

2- PROB 16: I pay closer attention to what I'm reading.

68% of the participants reported that they either usually or always use this strategy when facing difficulty to comprehend.

3- PROB 13: I adjust my reading speed according to what I'm reading.

67% of the participants reported that they either usually or always use this strategy.

4- PROB 21: I try to picture or visualize information to help remember what I read.

Only 9% of the participants reported that they either rarely or never used this strategy while reading.

5- GLOB 3: I think about what I know to help me understand what I read.

42% of the participants usually activate their prior knowledge while reading to understand the task in hand.

And the five least used strategies are:

1- GLOB 10: I skim the text first by noting characteristics like length and organization.

Only 11% always use this strategy while reading, whereas 53% of the participants reported either rarely or sometimes they used it.

2- SUP 9: I discuss what I read with others to check my understanding.

55% of the participants either rarely or sometimes discuss the text in hand with others to check understanding.

3- GLOB 19: I use text clues to help me better understand what I'm reading.

Only 35 % reported that they either usually or always use text clues to understand the text.

4- SUP 15: I use reference materials to help me understand what I read.

33% of the participants reported that they either rarely or never used this strategy while reading.

5- SUP 2: I take notes while reading to help me understand what I read.

30% of the participants either rarely or never take notes while reading. Other 30% sometimes use this strategy.

Table 8. The students' preferences of the reading strategies ordered in descending order from most frequently used to least frequently used.

Strategies	Mean	Std. Deviation
PROB27	3.982	.9160
PROB16	3.905	1.0074
PROB13	3.888	1.0433
PROB21	3.864	1.0290
GLOB3	3.722	.9696
PROB8	3.716	1.0476
PROB11	3.704	.9424
SUP12	3.669	1.1429
GLOB14	3.609	1.0585
PROB30	3.586	1.1675
GLOB25	3.580	.9486
SUP20	3.509	1.1450
GLOB26	3.497	1.0358
GLOB1	3.467	.9576
GLOB17	3.462	1.2101
SUP28	3.444	1.1226
GLOB29	3.432	1.1166
SUP24	3.414	1.0322
GLOB23	3.349	.9892
GLOB7	3.343	1.0411
GLOB4	3.314	1.2780
SUP5	3.296	1.3390
SUP6	3.219	1.0881
PROB18	3.219	1.0319
GLOB22	3.189	1.2439
SUP2	3.178	1.1564
SUP15	3.148	1.2986
GLOB19	3.112	.9966
SUP9	3.112	1.0880
GLOB10	3.089	1.1383

On examining the gender differences in strategy use preferences, the order of the strategies changed as shown in the appended tables 9 and 10. Yet, both genders prefer problem-solving strategies to global and supporting strategies. They rarely skim the text first (GLOB10) or use the context clues (GLOB19) or use external references (SUP15). They both barely take notes while reading (SUP2) or summarize (SUP6) and almost never check their understanding with others (SUP9). On the other hand, they both frequently use strategies such as rereading or adjusting their reading speed and slow down, or concentrate better, or use visual aids as remedial actions when understanding becomes difficult.

On examining if the educational system is affecting the students usage preferences of strategies while reading. The results are shown in the appended tables 11-14.

In table 11, the students of Indian system are reporting above average (M= 3.448) in more than 50 % of the strategies. They particularly reported higher metacognitive awareness level in problem solving strategies than in other subcategories. Furthermore, they reported weaknesses in the usage of the same strategies as the whole sample.

In table 12, the students of British system are reporting above average (M= 3.483) in 50% of the strategies as well. They also reported higher awareness of problem solving strategies. Moreover, they shared the same weaknesses as their counterparts in the sample.

Similarly, in table 13, the students of American system are reporting above average (M= 3.506) in almost 50% of the strategies. Their levels of metacognitive awareness of problem solving strategies are higher than the awareness of the other two subcategories as well. However, they show significant weakness in the strategy that requires them to decide on the relevance and importance of the information they are reading (GLOB7 and GLOB 14). Otherwise, they are sharing the same weaknesses as the others in the sample.

In table 14, Emarati system students reported declined usage of supporting strategies to reach better understanding such as paraphrasing, and building connections among ideas (SUP 20 and SUP 24). They expressed weaknesses in using contextual

clues, typographical, and visual aids such as figures and tables to better understand the text (GLOB 17, GLOB 19, and GLOB 22).

4.1.2 Inferential Statistics

In this phase, there are two hypotheses. The first (H_{Ai}) states that there is some difference in level of metacognitive awareness between male and female students. This hypothesis was tested by analysis of variance (one way ANOVA). The test was held for the overall MARSİ mean scores of both groups, as well as for the mean scores in the three subcategories. The results are shown in table 15.

Table 15. Analysis of variance (ANOVA) between the male and female students' scores in MARSİ, GLOB, PROB and SUP.

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
MARSİ Average	Between Groups	.038	1	.038	.165	.685
	Within Groups	38.326	167	.229		
	Total	38.364	168			
GLOB average	Between Groups	.025	1	.025	.091	.764
	Within Groups	46.835	167	.280		
	Total	46.860	168			
PROB average	Between Groups	.398	1	.398	1.330	.250
	Within Groups	50.037	167	.300		
	Total	50.435	168			
SUP average	Between Groups	.097	1	.097	.249	.619
	Within Groups	64.989	167	.389		
	Total	65.086	168			

As shown in the table above, with $df = n - 1$,

When MARSII mean scores were tested across gender groups,

F ratio = 0.165, p -value = 0.685 where $p < 0.05$

When GLOB subcategory mean scores were tested across gender groups,

F ratio = 0.91, p -value = 0.764 where $p < 0.05$

When PROB subcategory mean scores were tested across gender groups,

F ratio = 1.330, p -value = 0.250 where $p < 0.05$

When SUP subcategory mean scores were tested across gender groups,

F ratio = 0.249, p -value = 0.619 where $p < 0.05$

These results show that the difference in the overall level of metacognitive awareness between the male and the female students is not statistically significant. Similarly, the difference across the subcategories is not statistically significant. Therefore, the null hypothesis is accepted.

The second hypothesis (H_{Aii}) states that there are some differences in the level of metacognitive awareness among students of different educational backgrounds. This hypothesis was tested by analysis of variance (one way ANOVA). The results are shown in table 16.

Table 16. Analysis of variance (ANOVA) among different educational backgrounds groups' scores in MARSII, GLOB, PROB, and SUP.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
MARSII Average	Between Groups	.112	4	.028	.120	.975
	Within Groups	38.252	164	.233		
	Total	38.364	168			
GLOB average	Between Groups	.116	4	.029	.102	.982
	Within Groups	46.744	164	.285		
	Total	46.860	168			
PROB average	Between Groups	1.268	4	.317	1.058	.379
	Within Groups	49.167	164	.300		
	Total	50.435	168			
SUP average	Between Groups	.204	4	.051	.129	.972
	Within Groups	64.882	164	.396		
	Total	65.086	168			

As shown in the table above, with $df = n - 4$,

When the overall MARSII mean scores were tested across groups,

F ratio = 0.120, p -value = 0.975 where $p < 0.05$

When GLOB subcategory mean scores were tested across groups,

F ratio = 0.102, p -value = 0.982 where $p < 0.05$

When PROB subcategory mean scores were tested across groups,

F ratio = 1.058, p -value = 0.379 where $p < 0.05$

When SUP subcategory mean scores were tested across groups,

F ratio = 0.129, p -value = 0.972 where $p < 0.05$

These results show that the differences in level of metacognitive awareness among students from different educational backgrounds are not statistically significant. Similarly, the differences across the subcategories are not statistically significant. Therefore, the null hypothesis is accepted.

4.2 Phase II Data

This phase includes data collected from a sample of 29 participants representing a class of entry psychology. The data represents the students' scores in a demo studying session where they were handed an excerpt of their psychology textbook assigned by their instructor and that they were supposed to be examined in at the end of the term. They were asked to produce a summary of its main ideas using all they wanted of their usual practices while studying. The data collected from phase II is analyzed quantitatively. The students' work is marked according to the criteria in appendix 5. The marking criteria is based on the three macro-rules of summarization developed by Kitsch and Van Dajik (1978), as well as the effective reading strategies explained by Pressley and Afflerbach (1995) in the verbal protocol of reading.

The sample in phase II is composed entirely of female students ($n = 29$). This is to say that all descriptive and inferential statistics are going to represent the female population performance.

4.2.1 Descriptive Statistics

Chart 1 represents the percentage of students and the main ideas included in their summaries. Only 30.8% of the students captured 20 or more of the main ideas in the text. Only 10.3% of the students included 92.5% of the main ideas. 41% of the students included only 10 or less main ideas within the time frame.

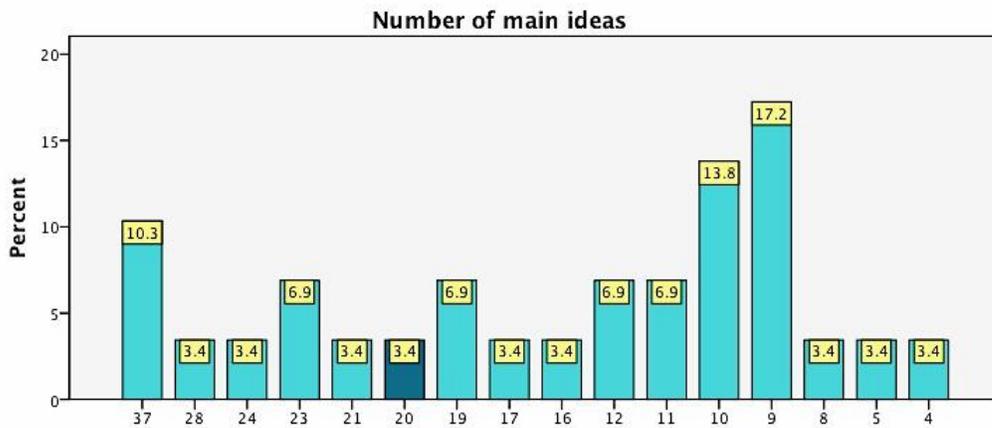


Chart 1. Students’ percentages of main ideas covered in their summaries.

Chart 2 represents the percentage of students and their usage of deletion rule in their summaries. 55% of the participants used it in a good way with more focus on the key ideas than the trivial information. However, 38% of the summaries introduced either redundant and/or unimportant information with abundance reflecting the lack of control that the students have.

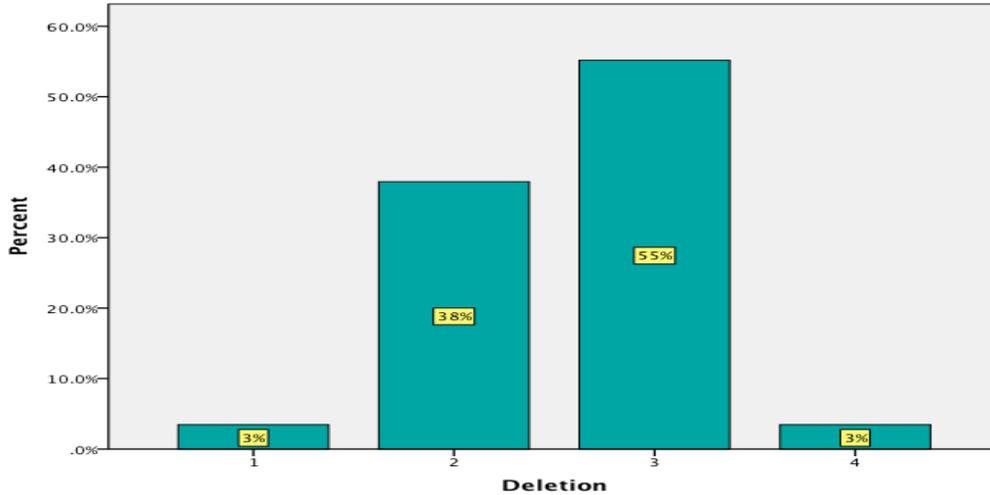


Chart 2. The deletion rule results

Chart 3 represents the percentage of students and their usage of generalization rule in their summaries. 52% of the students could efficiently use generalization while summarizing, whereas, 35% of the students couldn't use the strategy in an appropriate way.

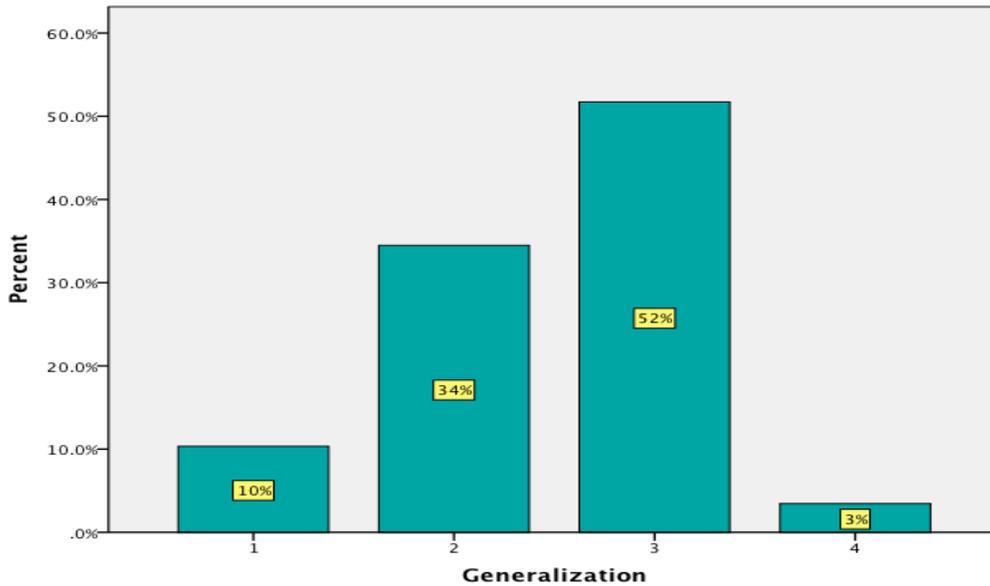


Chart 3. The generalization rule results.

Chart 4 represents the percentage of students and their usage of invention rule in their summaries. 90% of the students didn't show any knowledge or attempt to use this rule while summarizing. Only 3 students of the sample invented topic sentences to summarize a paragraph in the text in hand.

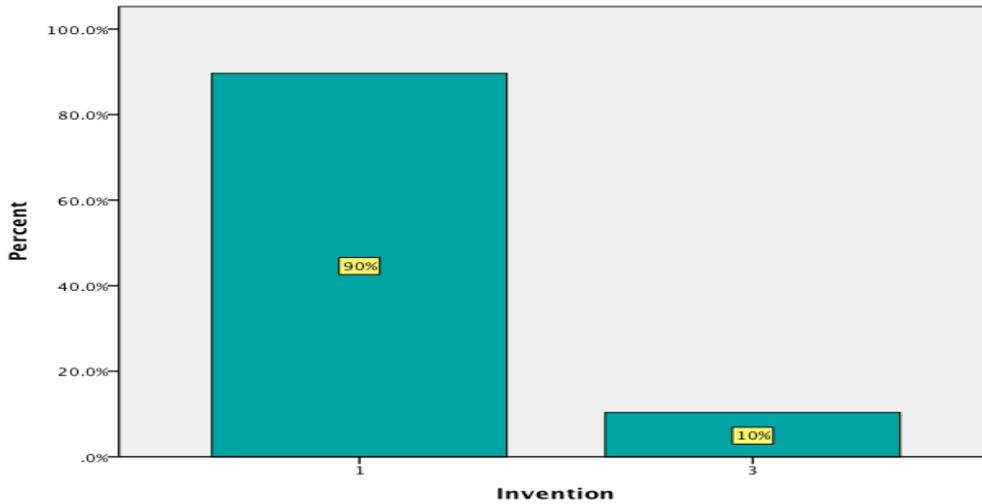


Chart 4. The invention rule results.

Chart 5 represents the percentage of students and their usage of either underlining or highlighting strategy while reading. Almost 41.5% of the students used this strategy in a good, relevant way, while 28% used it either in a limited way or underlined or highlighted irrelevant, and unimportant information. 31% of the students didn't use either at all.

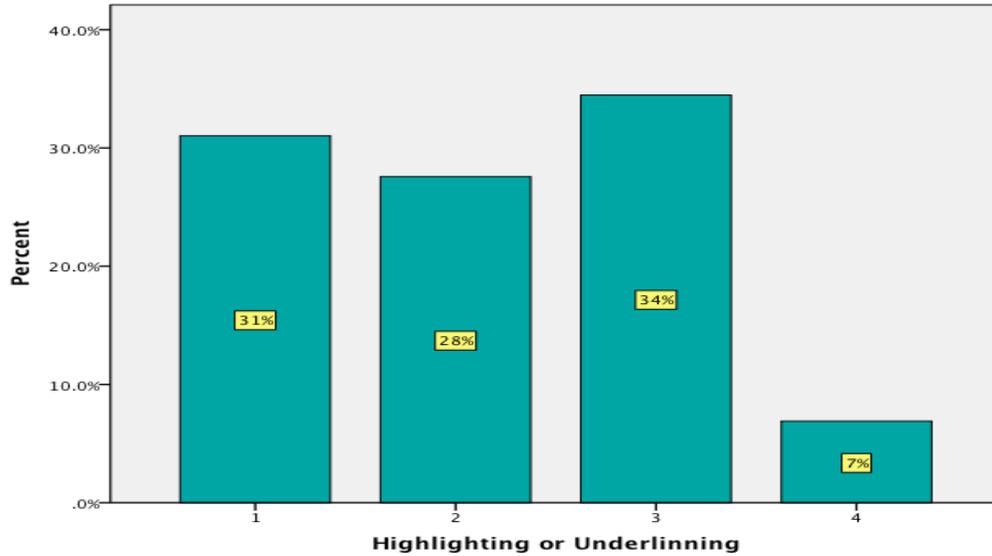


Chart 5. The highlighting or underlining strategy use results.

Chart 6 represents the percentage of the students and their usage of the questioning strategy while reading. Almost 52% of the students used the strategy in a good way, generating questions that capture the key ideas in the text. 28% of the students didn't use it at all.

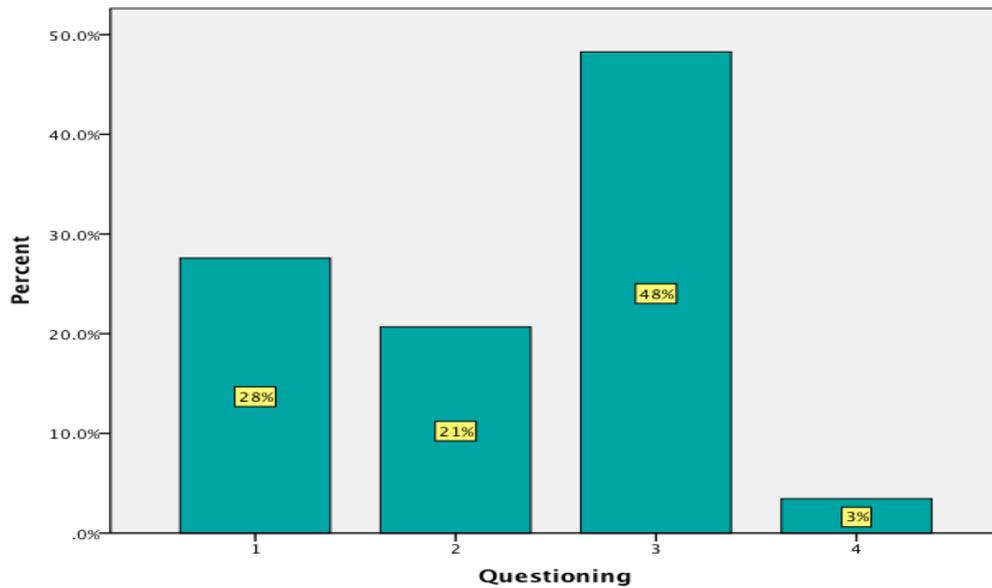


Chart 6. The questioning strategy use results

Chart 7 represents the percentage of the students and their usage of the mapping strategy while reading. Only 4 students used mapping while reading to summarize the key ideas and build connections. The remaining students didn't use this strategy at all.

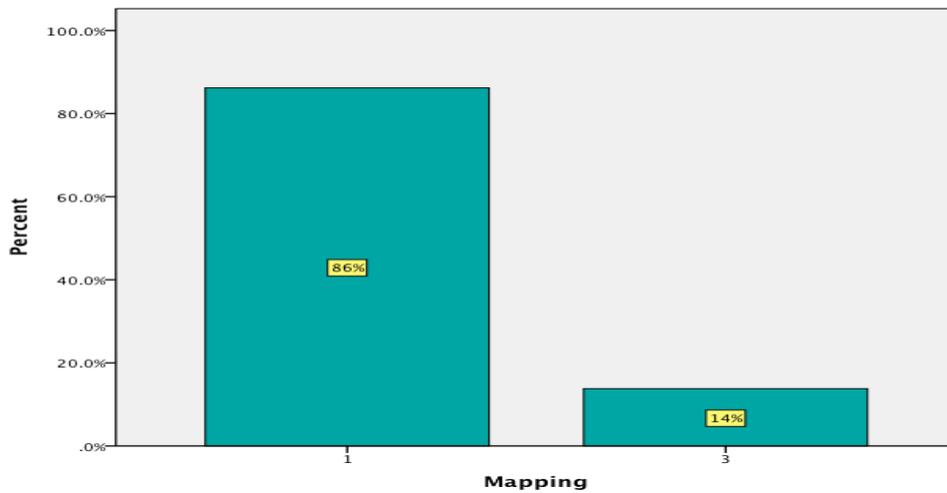


Chart 7. The mapping strategy use results.

4.2.2 Inferential Statistics

In phase II, there is one hypothesis (H_{Ax}). It states that there are some differences between what the students report doing and what they actually do while reading.

As no comparable study was found and ways to measure metacognition, especially, to compare the self reported metacognitive activities to the actual practices of the learners is still not established, we tried our best to compare the reported and the actual reading strategies of the participants quantitatively. Hence, six strategies were scored in the summary task and compared to the scores of six strategies on the MARSII survey. We paired each actual strategy to a reported one as follows:

1) Deletion.

GLOB14 I decide what to read closely and what to ignore.

2) Generalization.

SUP6 I summarize what I read.

3) Invention.

SUP20 I paraphrase or restate in my own words.

4) Highlighting or underlining.

SUP12 I underline or circle information in the text.

5) Questioning.

SUP28 I ask myself questions I like to have answered in the text.

6) Mapping.

PROB21 I try to picture or visualize the information.

Then, this formula was used to calculate the percentage of differences:

$$[(a - b)/b] * 100$$

Where a = the score of the reported strategy use on the MARSII survey.

b = the score of the actual strategy use in the summary task.

The percentage of difference that resulted represents the overall performance of the whole sample (n=29) in each strategy reported and actually used. The scores of the reported strategies range between 6 and 30, whereas the scores of the actually used strategies range between 6 and 24 per strategy per student. We assumed a threshold to accept differences by 25%. And the results show that

- 1) Deletion score = 75, GLOB14 = 96, and the difference = 28%
- 2) Generalization = 72, SUP6 = 93, and the difference = 29%
- 3) Invention = 35, SUP20 = 105, and the difference = 200%
- 4) Underlining = 63, SUP12 = 121, and the difference = 121%
- 5) Questioning = 66, SUP28 = 98, and the difference = 48%
- 6) Mapping = 37, PROB21 = 118, and the difference = 219%

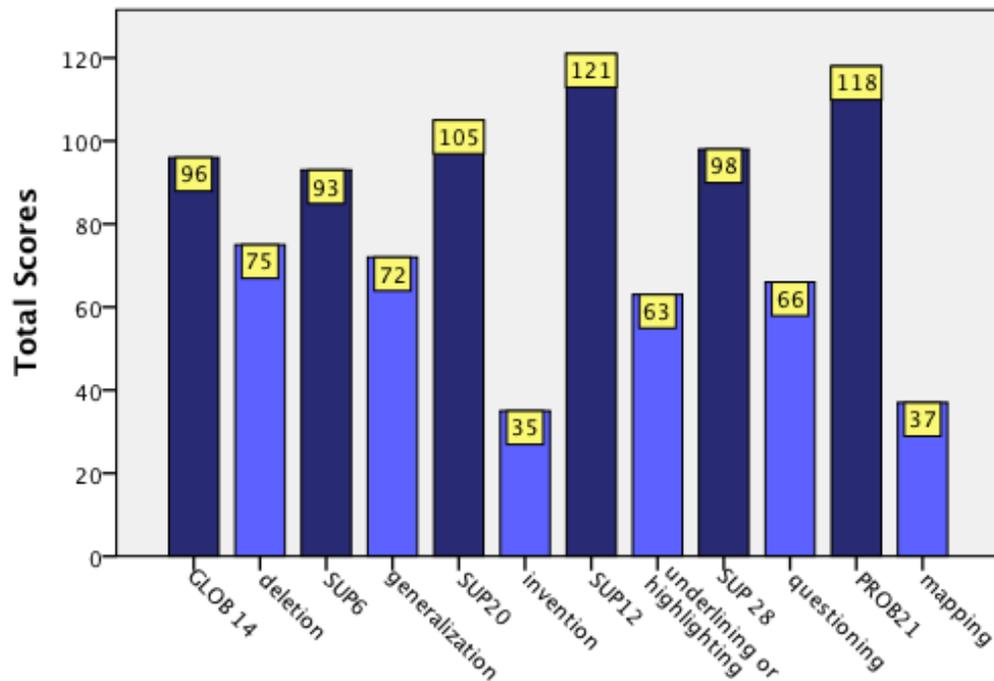


Chart 8. Summary of differences between the total scores in reported and actual strategies used.

The apparent inconsistency in the differences between what the participants reported they did while reading and what they actually did while reading to summarize give us enough evidence to reject the null hypothesis.

4.3 Summary of Findings

The main aim of collecting data by using different ways is to capture the overt and covert signs of metacognitive awareness and to inform the field of instruction of metacognition.

The data collected from the cross sectional survey shows medium to high level of metacognitive awareness of reading strategies among the participants. The first section introduces detailed descriptive analysis of the different groups of the participants within the sample. The differences and the similarities among their mean scores and strategy preferences are tabulated for easier access and review. Then, inferential statistics are used to investigate whether or not there are differences among different groups either due to gender or educational background.

The second section describes the students' reported reading strategies and their actual practices when in a reading for studying situation. Their overt practices and summaries are analyzed quantitatively and presented in charts to better compare and contrast their self-reported practices and their actual ones. A formula was used to calculate mathematically the differences between the reported strategy use and the actual strategy use while reading for studying.

4.4 Discussion

The results show that the first year university students perceive themselves with a high to medium level of metacognitive awareness of reading strategies. However, their actual cognitive and metacognitive activities while reading for academic purposes don't correspond to their self-reported levels of awareness. These results are consistent with the results of earlier studies (Perry & Winne 2006; Phifer and Glover 1982).

One explanation for this lack of correspondence could be that those students have never before had any formal instruction about reading strategies. It has been their first time to hear the term 'metacognition' and they had no idea what it stands for. Therefore, they are practicing those strategies automatically and without any conscious control of the procedural and the conditional aspects of the reading strategies. Brown (1987) has found that adults have difficulties reporting their strategies while reading, as some cognitive processes happen covertly that the reader is unaware of them. Moreover, it concurs with what educators agree on that students need to be taught explicitly a repertoire of strategies and to receive instruction on how to apply them (Garner 1990; Paris & Paris 2001; Pintrich 2002; Pressley 2000). They pointed out as well that instruction should be contextualized (Garner 1990; Pressley 1995) and should be given ample time to show results in students' performance, as Nist and Simpson (1990) noted that improvement in students' metacognition only occurred after four weeks of initial instruction.

The inconsistency of the strategy use of the university students reflects their lack of control over their cognition. This lack of control makes them according to Paris and Jacobs (1984, p. 2083) description of skilled readers as "often engage in deliberate activities that require plan-full thinking", makes them unskilled readers. They rarely have a purpose when reading a text, and then, they are oblivious to the strategy requirement to comprehend or to achieve their goal of the task. The reason for that would be lack of contextualized instruction that scaffolds them through the process of planning, selecting, monitoring, and evaluating of strategies while reading as recommended by educational researchers (e.g. Garner 1990; Justice & Dornan 2001; Pressley et al. 1998; Wilhite 1990).

4.4.1 Phase I

This study was implemented in two phases. In phase I, 169 university students were surveyed in the beginning of the first term of their first year at university. A self-reported survey (MARSI) was handed to students. 53.3% of the students reported high level in metacognitive awareness of reading strategies and 44.4% of them reported medium level of awareness. The students reported higher usage of problem solving strategies followed by global strategies and supporting strategies respectively.

Consistent with previous studies on gender differences in metacognition, female students didn't show much difference in metacognitive awareness level than male students. Likewise, the students' educational backgrounds didn't make much difference in their metacognitive awareness levels either. However, the differences were mainly among the strategy preferences of each group.

Poole (2005) examined the strategic differences in metacognitive awareness of male and female college students in ESL reading. He found insignificant differences between the two groups. Although Downing et al. (2008) found that female students showed more positive attitude towards academic studying, and higher self-regulation than male students, he confirmed that gender differences had no effect on the students' cognitive processes. And this may contrast with Zimmerman and Martinez-Pons (1990) findings that girls show higher use of learning strategies when examining 5th, 8th, and 11th grades. We contend that these results are affected by the age differences where there is evidence that regulation of cognition is developmental.

All participants reported frequent usage of problem solving reading strategies over global and supporting strategies. These findings are consistent with Mokhtari and Reichard (2002), as well as Alsheikh (2011). Nevertheless, the order of the strategies according to their usage differed among students' groups. Yet there are common strategy preferences such as rereading, slow reading, exerting more effort to concentrate, using visual aids like mind mapping. These strategies are mostly used for remembering a text (Pressley & Afflerbach 1995). They are mainly rehearsal strategies usually employed to recall information by rote. They are strategies for surface learning rather than deep learning. In contrast, elaboration strategies such as mapping and

questioning foster deeper level of learning (Garcia & Pintrich 1994; Schunk & Zimmerman 2003).

Furthermore, there is one global strategy that they all agree on using and it is activating prior knowledge to facilitate comprehension. This fits the cognitive psychology theories about learning that new information need to be assimilated and accommodated to one's own structure of knowledge (Piaget 1975) to make sense to the individual and hence, learning occurs.

Remarkably, the students expressed less frequent usage of strategies related to scanning and skimming, questioning, paraphrasing, summarizing, using contextual clues to promote comprehension of the text. These are strategies linked to deeper learning process (Garcia & Pintrich 1994; Schunk & Zimmerman 2003).

An unexpected yet interesting result is the variation among the strategy preferences of students from groups of different educational background. As a characteristic of the cosmopolitan nature of U.A.E., one can find different educational systems adopted in schools, and hence, a variety of educational backgrounds in one university campus. It is imperative to study the variable of educational backgrounds when studying college students' metacognition. Statistically, the analysis of variance doesn't show any significant differences in mean scores. However, the differences are in each group strategy use preferences. It is intriguing to analyze and discuss in details the differences in strategy use among the different groups, yet it is out of the scope of this study. Hence, the discussion of these results is going to be brief.

The similarities between the Indian and the British systems are evident in mean scores, students' preferences, and strategy use order. Students of both systems favor problem solving strategies such as 'adjusting reading speed' and 'rereading', and global strategies such as 'checking for inconsistency', 'determining what to read and what to ignore' over supporting strategies such as 'using external references', 'discussing with others', and 'summarizing'. While the students of American system agree with their counterparts in favoring problem solving strategies, they reported high use of 'using external references', and 'critically evaluate what they read'. However, they reported low use of 'determining what to read' as opposed to the Indian and British system' students. There is a large difference between American system group and the

Indian and British systems groups in the use of ‘ guess meanings of unknown words’. Those differences in strategy use should be further investigated with larger sample to find the reasons behind them.

As noted by Mokhtari and Riechard (2004), the literature on metacognitive awareness and reading strategies in college students from different cultures, linguistic and educational background is quite limited. Most found studies in this field are examining reading strategies from a linguistic perspective. The focus is on differences in first and second language readers’ metacognition and their strategy use.

Mokhtari and Reichard (2004) did a substantial effort to study the metacognitive awareness and reading strategies of college students in Morocco where English is their 3rd language and US where English is their 1st language. The main findings are that students at the same level of English proficiency and reading abilities use almost the same strategies for reading. They explain these findings saying that apparently, high level of reading competences eliminates cultural, linguistic and educational background differences in metacognitive awareness and strategy use. Later, Mokhtari (2008) explored the metacognitive awareness and strategy use of three proficient readers in three languages (Arabic, English, and French). He found that they all demonstrated the same pattern in strategy use, despite the linguistic, cultural and educational background differences among them.

Thus, previous literature supports our findings of minimal differences among groups of different educational background. However, these findings should be used with caution because students in UAE are coming from various cultural backgrounds and they are studying a certain educational system in schools that may differ from their cultures. Students in UAE are true example of multicultural and multilingual students and their metacognition should be examined in the light of those influences, taking in account as well, whether or not they were born and brought up in this country.

4.4.2 Phase II

Following the cautionary note of the MARSII survey authors that this survey is a self-report measure and should be used as an indicator of the level of metacognitive awareness of the students rather than a definite assessment or a sole measure of metacognition, we carried out a second follow-up phase in term II to further investigate the actual practices of the students while reading. A random smaller sample was drawn from the larger sample representing a class of entry-level psychology. A demo studying session for their upcoming MCQ exams was designed. The students were asked to read an excerpt of their textbook and produce a summary of its main ideas. The time was limited to 60 minutes to challenge the students. Only 3 out of 29 students could skim through the whole excerpt and point out more than 90% of the main ideas within the time frame. This could be referring to the individual reading speed. However, by skimming properly through the excerpt, students could have easily captured the headings, subheadings, captions and summary boxes at the end of each part. Lack of appropriate skimming strategy use caused the students to get confused with details and not to make efficient use of the instructed time frame. Moreover, this affected negatively their choice of important and relevant information to include in their summaries.

Half of the students showed reasonable skill in differentiating between the important information to include in their summaries and redundant information to exclude. Nevertheless, 30% of the students didn't use the underlining or highlighting strategy to define the important information that worth remembering for the exam. Similarly, 28% of the students didn't use self-questioning strategy to elaborate on the information and find a way to memorize it and synthesize it when needed. Visualizing the information or mapping is the least used strategy while reading for studying. Only 4 students used them.

The percentages of differences between the students' self-reported and actual cognitive and metacognitive activities while reading are

deletion/GIOB14 = 28%, generalization/SUP6 = 29%, Invention/SUP20 = 200%, Underline/SUP12 = 121%, question/SUP28 = 48%, Mapping/PROB21 = 219%

These results show inconsistency and lack of control of the students. They may know the strategies per se and acknowledge using them, but they don't know when, where and how to employ them. University students are constantly confronted by new reading tasks that would be challenging if they have no metacognitive control to use effective reading strategies according to the task demands (Brown 1987; Paris, Wasik & Turner 1996).

One explanation is that self-report tools only measure declarative knowledge of metacognition, even the domain specific ones like MARS (Cromley & Azevedo 2006; Veenman 2005). Whereas, procedural and conditional knowledge of metacognition need a measure that can realistically reflect the students' control and judgment of their strategy use.

The other explanation is lack of direct instruction of reading strategies. While declarative knowledge of reading strategies is important, accuracy in application is much more important (Pintrich 2002). Accordingly, teaching of procedural and conditional knowledge to students would enhance their perceptions and judgments in using reading strategies. Many researchers confirm that students who have received explicit instruction of metacognition and the effective learning strategies, will probably use them more frequently while studying (Bransford, Brown & Cocking 1999; Weinstein & Mayer 1986).

Although many researchers warned against self-report measures that they didn't reflect the actual level of metacognition, Baker and Brown (1984) argued that instead of dismissing this measure entirely, we should look for reasons for that inconsistency. They further explained that knowledge of metacognitive activities might precede the actual use of them. Therefore, the students' declarative knowledge of reading strategies is a good base to build upon through explicit instruction of procedural and conditional knowledge, as well as embedded training and scaffolding until they acquire the skills.

Chapter 5: Conclusion

5.1 Conclusion

Reading has exceeded being a language skill. Reading is a cognitive exercise that trains our minds to be in control of cognition and all the processes implied. It has been vastly investigated and a repertoire of reading strategies has developed. These strategies represent a systemized regime for cognition. Accordingly, readers are characterized by being good or poor readers.

Metacognition is developed when the good reader has ultimate control of this set of strategies, so that it can be regulated and synthesized in different reading situations. Metacognition development mandates awareness of strategies or cognitive tools, and goals of tasks, hence regulation of cognition while performing tasks.

The aim of this study is to inform instruction of reading strategies and to raise metacognitive knowledge and regulation awareness among university students through direct, systematic instruction. To achieve that the students' levels of metacognitive awareness and their reading strategy use have been explored by surveying (N=169) freshmen university students from diverse educational backgrounds and then, by comparing the reported strategy use to the actual strategy use while reading for studying. A detailed quantitative analysis of the collected data showed high to medium levels in metacognitive awareness of reading strategies. While discrepancies between reported and actual strategy use were evident. These results demonstrate that freshmen university students know the reading strategies per se but they don't have control on using them and they don't know when and where is appropriate to use them. These results are consistent with previous literature and support our initial assumption that a systemized, contextualized, and direct instruction of metacognitive knowledge and regulation of reading strategies is needed for university students to enhance their competences to be up to the tertiary challenges and requirements to succeed.

University students are expected to be expert readers. Theoretically, years and years of schooling should have a positive influence on their ability to approach

academic texts, to answer comprehension questions, including expository and inferential, and to produce a piece of writing with balanced evidence to support their stand point. But, in reality, new students face a big challenge when entering university for they discover that learning is no longer introduced to them in a spoon-fed fashion as they used to at schools, learning is managed by the academic staff but is almost entirely done by themselves. Students' strategy transfer takes a sustained amount of time to develop. In other words, students will not immediately embrace a new strategy and discard their time-honored approaches just because they heard a brief presentation on studying in college or completed a few workbook pages.

Skill acquisition and transfer rather than mere presentation of knowledge have been an ultimate goal of education. Skills like problem solving and self-regulation should be at heart of 21st century curriculum. Today's students need to learn how to execute tasks, take strategic decisions to define the goal, which task to pursue to achieve it, anticipate problems, set a repertoire of remedial actions to solve them, how to evaluate the final product. This may seem close to project management skills. Actually, that is true. The learner is the manager of her own cognition and should control it to achieve success in different tasks. To enhance these skills, appropriate instruction of metacognitive awareness (declarative, procedural, and conditional) is required to foster self-regulation (Paris & Winograd 1990).

Ever since 1927 when Book expressed the difficulty students faced in universities to cope with academic life and work, and suggested that especial programs should be developed to improve college student's study, the growth of these programs have been promoted by almost all higher education institutions. The approaches held through these intervention programs have been changing according to the developments in teaching and learning field.

Researchers in Education (e.g. Pressley et al. 1998; Albaili 1997; Curley et al. 1987; Tobias & Everson 2002; McCormick 2003) have vastly studied instruction trends, studying skills and factors to promote academic success and effective learning. They have decided on a framework of factors that affect studying successfully in higher education. These factors revolve around the learner-centered psychological principles declared by American Psychological Association APA work group (1997) and they are

the cognitive and metacognitive factors, the motivational and affective factors, the developmental and social factors, and the individual differences factors. It is difficult to separate the effect of one of them from the others. Furthermore, they constitute of intertwined variables that collectively, yet independently, contribute to the learning experience of the students. Each variable has been the focus of many studies to measure its effect size on students' achievement and learning. Hattie (2009) has meta-analyzed over 50,000 studies to determine the effect size of different variables on academic achievement. In an extensive analysis of the findings of those studies, he sketches a road map to answer the question of 'what works?' He found that the effect size of metacognitive instruction on students' performance to be an impressive $d = 0.69$ which makes it in the top 15 factors that influence the students' academic achievement.

According to Nist & Simpson (2000), studying programs in most universities rely on commercial models that are generic in objectives and texts for training. They are mostly irrelevant to the nature of the tasks and texts that students are expected to understand and deliver within a certain discipline. In other words, the training programs are domain free as opposed to the recent move towards domain specific training programs. Embedded approach where the training course is based on the actual assigned text in the main course, so that students would apply the strategies they learnt while actually studying for their degree is supported in many studies. By this way, learning is more meaningful and long lasting for after college years. As Garner (1990, p.523) asserts, "One thing that we already know about strategy use is that it is embedded. It does not occur in vacuum. When text varies, the nature of strategic activity often varies as well." Later, Martin and Arendale (1994) introduced the paired course approach that is, basically, a contemporary version of the embedded model. The paired course approach suggests that the studying program instructor should design and base the training of studying strategies on the main course outline, objectives, assigned readings, assignments and assessments, so as to scaffold the students through the academic experience and to develop their cognitive and metacognitive skills not only as skills for studying, but also for building their own epistemological systems (Nist & Simpson 2000).

Metacognitive awareness of one's own cognition and knowledge acquisition process develops with experiences and schooling. Paris and Winograd (1990,

p.8) describe, “ It [metacognition] is both a product and producer of cognitive development.” They contend that metacognition involves constructive strategic thinking that can be taught in classrooms. It adds new perspectives to traditional classroom problems such as production and extrapolation of strategies that once learnt in one context to another.

Developing skilled readers is a way for improvement in acquisition and production that, in turn, contributes in creating a life long learner and a problem solver. These two skills and the other skills implied in them are considered by OECD (2013) to be employability skills in the 21st century labor market, “proficiency in literacy, numeracy, and problem solving in technology rich environments is positively and independently associated with the probability of participating in the labor market and of being employed and earning higher wages” (OECD 2013, p.24). The positive effect is extended to the individual wellbeing and participation in social activities

In conclusion, we join previous researchers in college or completed a few workbook pages. As noted by Hadwin et al. (2001, p. 10) that strategic learning is “enacted over time through a series of unfolding events.” Hence, it is important to allow for that time and plan for recursive instruction of by providing for multiple passes and scaffolding. Perssley, ElDinary, and Brown (1992) estimated 1 year or more for students to become strategic while reading.

Despite the fact that students in universities almost entirely dependent on reading for knowledge acquisition and skill development, policymakers in higher education rarely impose well-planned academic support programs on universities. They leave the matter to student’ services unit in the campus. Although the efforts exerted by universities are pertinent, they are random efforts rather than systemized. Moreover, the importance of these programs aren’t stressed enough neither by the administration nor by the faculty. The stress is all on subject matter courses. This issue contradicts the 21st century labor market tendency towards nurturing skills over plain knowledge.

From the results of this study, we conclude that although university students may report high levels of metacognitive awareness, this knowledge is declarative. This alone is not enough to achieve their academic goals in university or their professional goals in life later on. This study adds to the body of knowledge in

metacognition to foster learning in their calls for an embedded instruction of metacognitive knowledge and regulation during schooling years that would be later of evident benefits in academic achievement in university and in developing a lifelong learner, a problem solver and a self-regulated individual.

5.2 Limitations

This study examined metacognitive awareness of academic reading strategies among freshmen college students in only one campus for access issues and lack of research culture awareness. It is recommended to explore more than one and compare findings to this study.

In this study, we used only a self-report measure for time and access limitations. Although it is a theory-based measure with high validity, using a think-aloud measure to follow up with the students and monitor their actual concurrent strategy use would have strengthened the study findings even more.

The random sample in the second phase happens to be all female students representing the psychology class. A further investigation of male students would be recommended.

Although we assume that the sample is of the same academic performance level, English proficiency, and socio-economic background, and we count for their different educational backgrounds during schooling years, we couldn't collect any data about the instruction methodologies in their schools, and whether or not they may include some indirect reading strategy instruction. While this variable may affect the level of metacognitive awareness of reading strategies, as far as we know at the time of the study, all the participants didn't receive any direct instruction or even heard about metacognition or reading strategies.

5.3 Recommendations for further research

Investigating the metacognition of the students in UAE academic context is definitely a rich field that need more studies to explore the new generation of students who were born and spent their childhood and schooling years in UAE as a different culture from their home country.

In phase II of this study, the comparison between the reported and the actual strategy use examined the overt strategies in reading such as underlining, paraphrasing, questioning. These are mostly supporting strategies and easier to assess than covert. However, a further investigation of covert strategies such as problem solving strategies would add to the body of knowledge regarding the comparison between reported and actual strategy use.

Additionally, we join Mokhtari and Reichard (2004) call for further investigation of whether or not major differences in metacognitive awareness and choice of strategy use can be weakened out by high proficiency in reading ability.