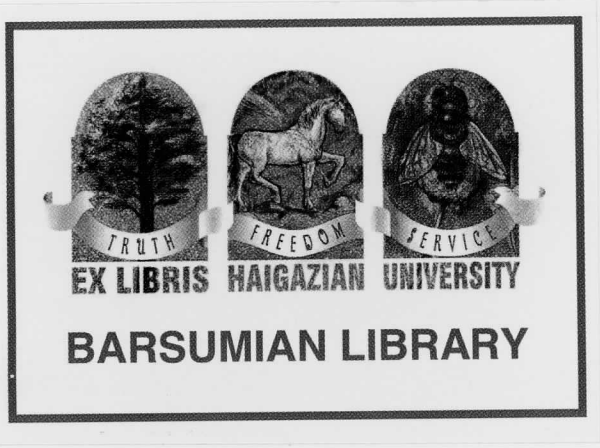

HAIGAZIAN UNIVERSITY

The Advantages of Knowing One's Learning style Among Lebanese High School Students

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A Thesis submitted to the Faculty of Social & Behavioral Sciences in partial fulfillment of the requirements for the Master of Arts degree in Education – Emphasis Administration and Supervision at Haigazian University

Beirut – Lebanon

June 12, 2012

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The Advantages of Knowing One's Learning Style Among Lebanese High School Students.

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ACKNOWLEDGEMENTS

First and foremost I would like to thank **God** for blessing me with so much among them this thesis.

I would like to thank my advisor, **Dr. Hanine Hout**, who patiently guided and encouragement me with lots of care.

Special thanks to **Dr. Daoud Tawil** and **Dr. Daisy Warren** for their positive input as my educators. And a Hearty thanks to **Dr. Chris Moacdieh** for his inspiration.

I would also like to thank **Rev. Dr. Paul Haidosdian** for making all this possible.

I would like to dedicate this thesis to my family and especially to my sister, **Victoria Soghomonian**, for without their love and support this would not have been possible.

DEDICATION

To my family and friends for their unconditional love,

support and encouragement

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Abstract:

The last several decades has seen the emergence of "Learning Style", the approach that states that each student has a unique and preferred way to study and assimilate information. Learning style is an individual's unique approach to learning, and by knowing and understanding one's style; one can optimize one's learning experiences both in terms of time, quantity and quality of information absorbed. This descriptive study will try to explore the different theories and models surrounding the topic of learning styles. The study participants are high school students in the Lebanese educational system. The aim is to present accessible approaches that allow a student to recognize their individual learning style, optimizing and enhancing their learning experiences.

INTRODUCTION

Schools were established to provide knowledge to the public, in the belief that knowledge will empower a person to achieve more in life and be a productive member in society. But lately we see that schools are viewed, at least by some students, as a boring and uninteresting place where they are not always motivated to learn. This is one of the causes contributing to the rise of the number of "educated illiterates". One of the reasons students view schooling negatively may arise from the students' inability or unawareness of how to study effectively as well as efficiently.

Each person is unique and special and has a different way of studying, a preferred way of encoding new information and storing it for future use. In the last decades, educators have been interested in how students learn and this has given rise to numerous learning style theories which are also referred to as "learning preferences". Some educators like Dunn (1990) believe that everyone can learn every subject but each has his/her own way of learning, which is called a "learning style" or the learning preference of an individual- in short, the way an individual learns best.

And while we learn differently, most of us are not fortunate enough to have our teachers address our learning needs. In Lebanese secondary schools, teachers are mostly interested in covering the academic curriculum instead of trying their best to cater to each student's learning needs and abilities with the excuse that they are teaching for the test/ official exam. In recent years, some educators have tried to make learning fun by introducing different teaching methods, such as, technology, trips, and experiments, into the curriculum. While this has helped some students whose learning style fits the particular method, others remain facing challenges and difficulties in their learning process. However, due to individual different learning styles, students who know their style can optimize their time and

studying effort and achieve more, while those who don't may spent long hours studying without much positive progress. Some may even be tempted to cheat to obtain a passing grade. Teachers consider these students as lazy or label them as underachievers, but in reality they are 'lost" and in need of guidance and help. Dunn (2009) states some teachers are quick to label a student as 'limited' or 'lazy' instead of taking the time to find out how to help the him/her to accomplish learning.

We note that flexible teaching style on the part of the teacher also helps. When a teacher knows the learning style of the student and adapts her teaching style to match that of her students, then both the students and teachers reap the benefits. As an example, if the majority of students are kinesthetic learners, she might include more experiments or role plays in her lessons. Or if the students are visual learners, she might hand out the main points of the lesson along with graphs to aid them in remembering the main points.

Statement of the Problem

As mentioned above, each student has a different way of storing new information. If the student does not know his/her own style, he/she may spend an enormous amount of time studying a given subject and chances are he/she may soon forget it, because the right way- an individual's own style-was not used. Soon after that, learning new things becomes a burden and after a while a person may even give up, thinking that he/she cannot succeed academically.

In order to avoid this, students should be familiar with their learning style, and the strengths and weaknesses of each style, and learn accordingly. By doing so, they will not only improve their academic level but also will be able to retrieve information more frequently, accurately and in different situations as the need arises. For example, a formula learned in mathematics class may also be used in solving a physics or a chemistry problem.

Research by R. Dunn, (2009) provides supporting evidence that if students learn according to their learning style they will achieve more academically and also they will become confident about their abilities. They will also be more realistic about what they can accomplish.

Fleming (2006) emphasizes some interesting points about learning styles. While considering learning styles one must keep in mind that there is no 'right or wrong' style; every one of us is different and because of these differences every one of us has a preferred way of encoding new information. Another important point is that people cannot be categorized into clear-cut groups; some of us have overlapping preferences. A person may be a combination of visual, auditory and kinesthetic or auditory and kinesthetic or only auditory. So the aim is not to categorize but to inform and educate people about their learning style to help in accumulation, assimilation and processing of new information.

Purpose of the Study

Learning styles is important because it boosts the self-esteem of a student and guides him/her in the way that he/she can learn best, as stated by Hodgin (1997). The purpose of this descriptive study is to assess the Lebanese students' understanding of their styles as well as their perception of the role of teachers in acknowledging and taking into consideration such different styles.

Research Questions

Based on the purpose of the study, the following major research questions were formulated:

1. **Do Lebanese students know their learning style?**
2. **Do Lebanese students make use of their learning style, in order to achieve more academically?**
3. **Do Lebanese teachers take different learning styles into account when teaching a new concept?**
4. **Does knowing one's learning style help in developing effective study habits?**

Method

This is a qualitative analysis of learning styles among Lebanese high school students. Since learning styles is relatively a new concept among Lebanese teachers and students, no significant research is available to provide context for this study. Thus a qualitative research methodology based on research questions and not hypotheses, seemed to be the more appropriate choice of this preliminary work. It is hoped that the data collected, analyzed and presented will motivate further research in this area in Lebanon, with the aim of helping Lebanese students, their teachers and their parents in achieving academic success.

Participants

The participants of this study were 10^{th}, 11^{th} and 12^{th} grade students from 5 different private high schools in Beirut. 300 questionnaires were initially distributed and 260 were returned. The final participants were: 104 students from grade 10, 91 students from grade 11, and 65 students from grade 12. There were 113 males and 147 females. The age range was between 14 to 18 (M= 16).

Materials

To assess the Lebanese students' understanding of their styles as well as their perception of the role of teachers in acknowledging and taking into consideration such different styles, a questionnaire was prepared consisting of a total of 63 questions (see Appendix A). The questionnaire consisted of four major parts:

1) Demographic information.
2) A concise definition of the Visual-Auditory-Kinesthetic (VAK) style to aid the student in determining his/her learning style. (See *question 1* in the questionnaire).
3) Fifty short questions (yes/no type); *questions 2-51*, subdivided into three categories:

   (i) *Questions 2-25:* related to study habits

   (ii) *Questions 26-43:* the VAK scale (although there are different learning styles discussed by different researches, this paper will focus on the VAK style. The VAK scale used was designed by Nicola Slack and Brahm Norwich (2007) of the University of Exeter in UK. The authors narrowed down the questionnaire to18 questions, as a shorter version of Neil Fleming VARK questionnaire.

   (iii) *Questions 44-51:* short questions related to using different learning styles.
4) Essay questions about how students study different subjects, especially Math, Arabic History and Civics, (see *questions 52-63* in the questionnaire).

Procedure

At first, a pilot study was conducted. The questionnaire was distributed to a group of 30 students to make sure it was understood clearly by all the students. Upon the consent of the principals of the different schools, the questionnaire, consisting of the four major parts, was distributed to 300 students from grades 10, 11 and 12. A total of 260 responses were returned and used in the study. The students were told that their answers will be confidential.

A teacher was assigned to supervise the students to address any questions they had. The students were told that the questionnaire is part of an MA thesis written by a graduate student at Haigazian University. All the students participated voluntarily. The answered questionnaires were collected by the supervising teacher and returned to the author.

Professional Significance of the Study

There were two significant points addressed by this study. Firstly, the study was conducted to familiarize the Lebanese reader with a relatively new topic, namely "learning styles". Besides introducing a new educational approach, the study demonstrated how the knowledge and application of one's learning style enhances one's learning experiences.

Secondly, this study was conducted with the hope that educators, teachers and parents will keep an open mind regarding the idea of different learning styles of their students and children, with the aim of maximizing the learning experiences offered both in school and at home. It is also hoped that teachers, faced with a classroom of students with different learning styles, will use various methodologies in explaining new concepts, in order to reach every single student.

Definition of Terms

Several terms are used in the study, and their definitions in the context of this study are presented below:

Learning Styles: Hawk (2007, p. 7) defines this as "an individual's characteristics and preferred way of gathering, organizing, and thinking about information.

VARK: Fleming (2006) categorizes learners into 4 groups VARK; the acronym VARK stands for **V**isual, **A**ural, **R**ead/W**r**ite and **K**inesthetic.

VAK: Slack and Norwich (2007) further modified and simplified Fleming's original VARK definition to VAK, which stands for **V**isual, **A**ural, and **K**inesthetic.

Visual Learners, are learners who prefer maps, charts, graphs, diagram, brochures, flow charts, highlighted sections, different colors, pictures, word pictures, and different spatial arrangements.

Aural Learners, are learners who like to explain new ideas to others, discuss topics with other students and their teachers, use tape recordings, attend lectures and discussion groups, and use stories and jokes.

Kinesthetic Learners, are learners who liked field trips, trial and error, laboratory experimentation, recipes and solutions to problems, hands-on approaches, use of their senses, and etc.

Delimitations

A potential limitation of the study was the number and types of participating schools. Five private schools participated in this study. A larger number of schools with a mix of public and private schools from different socio-economic backgrounds could have enhanced the results of the study and provided us with more insight about this topic in Lebanon.

CHAPTER 2

Review of Literature

What is Learning and What is Learning Style

Learning is part of our daily life for every one of us is faced with new situations every day. According to Felder (1988), learning composes of two main steps: the reception step, where the student chooses which information to process and which to eliminate based on his/her preferences; and the processing step, where the information is consumed. According to Davis (1994) whenever we are faced with new information, every one of us has a unique and different way of processing it, encoding the new information in a way that is easy for him/her to decode it when it is needed; this is a person's own learning style. Cuthbert (2005) adds that not only the way a person acquires a new information is important but also, more importantly, how he/she finds the connection between the new information and preceding knowledge, or how he/she find connections with future information. That is, how individuals use what they know and how they can apply their knowledge when needed in the right way.

Davis (1994) states that although teachers are not responsible for their students' abilities they are nevertheless responsible for motivating and helping them to develop to their full potential. One of the ways a teacher can help her students is to find their learning style. Moreover, Felder and Silverman (1998) state that how much a student learns in a class relates partly to his/her ability and level of prior preparation and partly to the compatibility of his or her learning style and the instructor's teaching style. Haar (2002), on the other hand, confirms that learning style relates to the individual differences in the way information is perceived, processed, and communicated.

The Importance of Learning Style

In traditional schools, teachers teach using lectures as their main teaching method. While this may seem like a suitable way for some – whose learning style is auditory- it is inappropriate for others who have a different learning style, and thus become bored and frustrated. Moreover, such students might start to doubt their abilities thinking they are not "up to the standard" or "not as good as others". These are the students who need help and encouragement, or else they might fail academically.

Dunn (2009) agrees with this point, stating that knowing and using one's learning style is the best way for each individual to learn. Such knowledge gives the student the confidence as well as the tools to become an academic success. Everybody can learn if he/she has the right mindset and follows a few simple learning style guidelines. From her research, Dunn concludes that students wanted to know their learning styles because: a) they now know *how* to study in the most effective manner, and b) they know it is more important *how* they study rather than the subject matter itself. As a consequence of effectively studying any subject, students achieve more, which in turn motivates them and boosts their self-image.

In 2008, the American Association of Colleges for Teacher Education established 13 basic and vital knowledge "courses" that every teacher should be acquainted with, among them, Smith's Learning Style. Dunn (1990) supported this point by giving a couple of examples of different schools where learning style was taught to students. The results showed that students obtained considerable academic achievements, and more importantly, the underachieving students and previously failing students had a more positive attitude towards school and schoolwork. Some examples of these schools are: i) The Center for Educating Students with Handicaps in Regular Education Setting (CESHRES); ii) Sacred Heart Seminary, Hempstead, NY; iii) Center for Slower Learners, Texas; iv) The Frontier and

Hamburg School Districts; v) The Brightwood Elementary School in Greensboro, North Carolina; vi) Amityvill High School NY; and vii) Corsicana High School Texas.

Defining Learning Styles

Cuthbert (2005) suggest that the terms *cognitive style* and *learning style* are sometimes mixed up because "they are derived from four areas of psychology. These are 1) perception, 2) cognitive controls and cognitive processes, 3) mental imagery and 4) personality constructs". Cuthbert (2005) also refers to previous research in providing a definition for cognitive style, and states "this term is used to denote an individual's consistent preference for particular ways of gathering, processing and storing information and experiences… a fusion of particular methods of thinking and of personality" (Cuthbert, 2005, p. 236). Dunn (2009) provides a similar definition when she concludes that learning style is the way individuals begin to concentrate on, process, internalize, and retain new and difficult information; in short, the best way to learn something difficult is by using one's learning style.

Hendry (2005) states that "there is evidence that our personal learning style is relatively stable over time, although we can adapt our style to the demands of different situations" (Hendry, 2005, p. 396). According to Fleming, "a learning style is, [rather], a description of a process, or of preferences. Any inventory that encourages a learner to think about the way that he or she learns is a useful step towards understanding, and hence improving learning" (Fleming, 2006, p. 4).

Cuthbert (2005) refers to different researchers and defines learning preference as an individual's cognitive style which will help a person in dealing with new information in the way that suits him/her best. Cuthbert also mentions that one must be careful and not confuse *style* with *ability* because style is independent of ability. A person may ace a task not because

of ability only but because the task fits his/her style. For example, a visual learner may have a high grade in biology which contains more figures than literature. Furthermore, Fleming (1995) prefers the use of *learning preference* instead of *learning styles* because he considers it a guide rather than a label.

Different Learning Style Theories

In the past few decades, different theories of Learning Styles have emerged, yet no one can say which learning style is the right one as they each deal with different issues regarding learning. Each style is supported by numerous research results. At the same time, each style is faced with criticism -both general and specific.

There are similarities among the Learning Style theories. They all stress that it is important to acknowledge individual differences –the way each person prefers to learn- and teach accordingly so as to get the most out of it. And while there are similarities, no one has yet combined all of them together so that we can have a single "Learning Style". According to Dunn, there are different learning styles models because "different pioneers recognize individual differences based on their particular experiences, name the characteristics they observe, and described them in nomenclature that made sense to them" (Dunn, 1990, p. 15).

Pitts (2009) summarizes the work of different researches by classifying those under five categories, where each category identifying learners in different terms:

1. **Gregorc and Butler:** They believed every learner is a single or a combination of the following: *Concrete* (those who have to be physically involved), *Abstract* (those who synthesis information to get to the whole), *Sequential* (those who are organized and need detailed explanation), or *Random* (those who learn from the general/ the whole to details).

2. **Sims and Sims:** They identified learners as *Cognitive* (those who have to understand the parts in order to understand the whole), *Perceptual* (those who rely on visual aids to analyze concepts and obtain the whole picture), *Behavioral* (those who are physically involved), or *Affective* (those who learn through their feelings).

3. **McCarthy:** They classified learners as *Analytic* (those who in order to understand the whole idea, need to development each fact alone), *Imaginative* (those who use visuals- real or imaginary), or *Dynamic/common sensible* (those who are practical and learn by interaction).

4. **Harb, Durrant,Terry:** They grouped learners as *Reflective/abstract* (those who have to find relationships/connections among the information they learn about), *Concrete* (those who need visual aids in order to get the whole concept), or *Active* (those who have to internalize the information by relating it to a personal experience).

5. **Sarasin:** They identified learners as *Auditory* (those who need to hear the information presented), *Visual* (those who need the aid of visuals to understand new information), or *Tactile/Kinesthetic* (those who need to learn by being engaged in physical activities).

This paper is based upon Sarasin's work, which was later developed by Fleming, and presented by Hawk (2007) in an article illustrating different learning styles. According to Fleming (2006), VARK –a definition of a **V**isual, **A**ural, **R**ead/W**r**ite and **K**inesthetic learner) is a catalyst for metacognition; it is not a diagnostic or a measure. He was puzzled why some students could while others couldn't learn so well in a given classroom taught by the same teacher, and based on his observations; he developed preferred styles of learning. He was aware that certain factors could not be changed -curriculum, the set hour of school and courses- but he proposed that by knowing one's preference in learning one could study accordingly and thus achieve learning. Knowing one's learning style is only the first step, it

has to be accompanied with actions, reflective metacognition and use of strategies to improve one's learning methods. This is supported by Fleming, who stresses that knowing one's learning style and accompanied strategies, which he calls active and effective metacognition, is necessary to improve one's learning experiences.

According to Fleming (2006), learning styles are not constant over a person's entire lifetime, but they are stable during a given time interval. So students can identify their style and act accordingly. Moreover, they can use the learning strategies that correspond to their learning style. In regard to learning styles, Slack (2007) states that one must keep in mind that although there might be some students who have a clear-cut style, e.g. they are totally visual or totally kinesthetic, others may be combinations of several styles, e.g. visual-auditory or visual-auditory-kinesthetic. Thus combinations of styles should also be considered.

Visual-Auditory-Kinesthetic Scale

While it is certainly interesting to find out whether one has an inborn ability to excel at science or languages, it is probably more productive to know how to learn the skills needed to successfully complete an academic curriculum.

Pitts (2009) agrees with Dunn and others that if students are taught according to their learning style, they can achieve higher grades. So a teacher must be able to identify the different learning styles that are found in her classroom. Slack (2007) argues that in order to determine one's learning style, a scale or a questionnaire which helps "identify" one's learning style is needed. Pitts (2009) states that in the 1990s, 32 published learning style scales were available and we note that many more have been developed since.

For the purpose of this paper, Slack and Norwich's (2007) version of Fleming's original VARK questionnaire was used. Unlike Fleming's original questionnaire, the

questions chosen were more suitable and understandable by Lebanese high school students. (See questions 26-43 in the questionnaire in the Appendix).

The Critics of Learning Style

If learning styles are so important why isn't everyone using it? According to Fleming (2006), learning styles received bad reviews because researchers could not measure learning or know if learning had actually taken place. A typical example would involve a student stating that they do know a specific lesson, but when questioned about the lesson a few days later, the student would have forgotten the material. And while the student may have memorized certain terms, learning and understanding may not have occurred. Did the student learn the lesson, perhaps for a very short time, or not? Quantitative measurements of learning are not easily obtainable. Yet, Hall (2007) argued that knowing and applying learning styles in classrooms is both beneficial to the student and the teacher. Hall analyzed 13 theories and models of learning styles in-depth and concluded the following:

a) Most models emphasize learning characteristics and neglect acquired subject knowledge and skills. Moreover they ignore the differences among different subjects; for instance, biology as a subject is more visual than literature.

b) Most learning styles models lack thorough research. Either the research is done by the educators who then name the model after themselves, or the models are faced with controversy. Further, most learning styles cannot be considered "reliable and valid" because no one can be absolutely sure that the model is indeed measuring what it intends to measure - learning.

c) There is little evidence that using learning styles in classrooms has a significant effect on students' academic achievement or motivation for learning. But there may be a beneficial effect.

According to Otrar (2007) learning used to consist of the 3Rs- reading, writing and basic arithmetic. Through time, educators discovered that the basics were not enough and so they started to stress on the importance of critical thinking and reflecting on what is read. Thus, instead of just reading a text or expressing oneself clearly so as to avoid misunderstandings, critically and analytically approaching a problem and its solution became the main objective of learning. Otrar concludes that learning styles are not associated solely with ability, but rather, they are preferred ways of expressing or using a person's abilities.

Learning Styles and Gender

A study by Le Cornu (1999) concluded that gender does not play a role when it comes to choosing a particular learning style. However, Le Cornu found out that both males and females may change their learning style in time, in the sense that they learn to adjust their learning styles to given situations. Cooper (1969) also concludes there is no difference among males and females when it comes to learning styles, but he discusses other factors that influence learning - a person's upbringing, home situation, school and teachers, personality and most importantly, ability.

Learning Styles and Corresponding Teaching Styles

As Dunn (2009) clearly states, teachers now realize that "one size fits all" is not applicable anymore and thus they design their lessons to match different learning styles. Davis (1994) concludes that as teachers take learning styles into consideration and teach accordingly, the learning experience becomes more productive -that is the students learn more. Also as the students learn about their style, and the strengths of their style, they are able to cope better with the mode of delivery by their teacher. It would be helpful if teachers provide different activities on a given concept so as to reach all the students, who in turn will be more motivated to learn and, consequently acquire and enjoy a sense of accomplishment.

Teachers can also help students, through trial and error, experiment with different learning styles in order to find the most appropriate activities for a particular subject. Davis also gives suggestions for teachers as to the benefits of each learning style, and the type of assignments that could accompany each different style; an example could be providing a visual student with written assignments and not oral quizzes.

Dunn (2009) states that several colleges have realized the value of helping students learn about their learning styles, and have arranged for seminars about the subject. These seminars familiarize students about learning styles, and provide them with necessary tools to facilitate learning. These seminars have results not only in improved student grades (by improving study skills) but have also increased self- awareness among the student body.

Schools have also included learning styles in their programs, so that teachers become aware of their students different styles. Some colleges even had programs for the parents. Some universities, realizing the importance of learning styles, have included learning styles courses in their education program.

According to Felder and Silverman (1988), when the teacher's teaching styles and student's learning styles differ, the result is not only poor grades but also students become inattentive and bored. Thus students lose interest in the lesson followed sometimes by a more serious consequence, self-doubt. Dunn (2009) refers to two mega studies, where the outcome showed that if students' learning styles were taken into consideration by teachers and lessons were explained accordingly, then every student regardless of his/her style could obtain a better grade.

According to Otrar (2007), each student is unique in the way he/she internalizes new information and uses it. This is why there are differences in academic achievements in a given class with the same teacher. Teachers should be prepared to explain a new concept in

different ways so as to satisfy all. Because once a teacher knows the learning styles of her students and she teaches them accordingly, then effective learning takes place. Dunn (2009) gives an interesting definition explaining that in order for each student to learn effectively, the teacher should use every mean necessary "to teach effectively, instructors must know how to teach individuals on the basis of their identified brain processing, environmental requirements, sociological inclinations, perceptual strengths, and interests or talents. That is what learning style identification provides" (Dunn, 2009, p. 139). Franzoni (2009) explains each style and provides corresponding electronic media that can guide teachers in choosing various teaching styles, so more students can benefit. For example, visual learners can assimilate/ absorb new information better if it is given in a visual format. Hawk (2007) concludes that students learn in diverse ways and therefore teaching only in one way is not acceptable or effective. Otrar (2007) strengthens this argument by stating that "If the learning environment is organized in harmony with the student's learning characteristics, the quality and size of learning grows" (Otrar, 2007, p 1408).

Fleming (1995) believes that learning styles or preferences are useful in education and may even be regarded as a key to effective learning because they help students in focusing on their strengths, and teachers in using various modes to explain concepts. Often, when a student asks a teacher to re-explain a concept, usually the teacher would raise his/her tone and repeat what was said in a slower pace. The teacher's response is not really addressing the situation of the student not understanding the concept; the teacher should explain the concept in a different mode or style to the student. So teachers should be informed about different learning styles and try to address these differences by providing explanations best suited for a particular style.

Hawk (2007) believes that teachers in universities adopt a teaching style that merges the way they themselves prefer to learn as well as approaches to teaching that they see

effective for their own learning. The apparent conclusion is that faculty who are consciously aware of their students' learning styles as well as their own are in a position to make more informed choices in course material, design, and learning processes to broaden the opportunity for effective learning in their courses. Hawk concludes that a use of a variety of teaching and learning approaches has the potential to enhance the learning and performance for a wider range of adult students in a course, and expand the learning approaches with which adults students are comfortable and capable of learning.

In a study by Haar (2002), teachers were asked if they knew about learning styles, and if so, how that reflected in their teachings. Firstly, even though not all teachers could remember the technical terms they could all describe the different learning styles by referring to their students, they knew some needed written instructions, the visual learners, while others would learn best just by listening, the auditory learners. And because they were aware of these differences among these students, they taught new concepts in different ways. So learning styles are not just a label, they are personal connection between teachers and students.

Secondly, Harr noticed that teachers were evaluating their teaching styles and were ready to modify and change in order to be sure that all their students understood a new concept. For instance, they would change the method when their students did poorly on a test. Also most teachers agreed that even when students understand a new concept at first, it is necessary to review the concept after some time. Thirdly, teachers felt responsible for the learning of their students and so they would seek and try different ways to reach them. Thus, by constantly reflecting on their teaching, teachers are changing their teaching styles, and aim to reach each student. Harr concludes that teachers depend on their experience more than their knowledge of learning styles terminology. Harr ends by saying that every one of us,

teachers and students, must "know oneself" for self-understanding is the key to understanding, communicating, and learning.

Learning and Study Skills

The way a student studies effects his/her performance outcome. According to Cooper (1969), not much has been done to see how study habits can affect a student's academic performance, and more specifically, which habits are necessary to be developed for academic success. Cooper's (1969) findings were double-edged. On the one hand, his findings were similar to those of Fisher and Cotsonas who concluded that those students who were weaker academically were the ones who tried even harder than their peers. On the other hand, Cooper's findings were also similar to previous findings of Brown and Holtzman (1955 and 1956) and Wrenn and Humber (1941) who stated that those students who were academically successful were the ones that planned carefully and worked steadily, spreading their studying time evenly. Another outcome of Cooper's (1969) findings corresponded to Weigel and Weigel 1967 findings that stated "knowledge of study habits and attitudes correlated highly with performance for men but not women". Yet, on the last outcome, Cooper had doubts and raised the possibility that the questionnaires were not honestly filled out, or that they were filled out in a haphazard manner.

Good study skills are important because they are the tools used to gain and preserve new information and thus obtain knowledge. Al-Hilawani stated that in order to succeed in university one must have well-developed study habits such as attending classes regularly, bringing needed materials to class, finishing homework on time and sustaining attention in class. Students with high averages are usually the ones with good study skills, self-awareness, purposeful planning and self-adjustment activities. Al- Hilawani concluded that study skills

are vital for "knowing, knowing what to know, and knowing how to know" (Al-Hilawani, 1997, p. 6), and suggested establishing an office to help students facing problems.

In light of the review of literature discussed in this chapter, this thesis attempted to assess the Lebanese students' understanding of their learning styles, as well as their perception of the role of teachers in acknowledging and taking into consideration students' different styles. More specifically, it investigated the four research questions:

1. **Do Lebanese students know their learning style?**
2. **Do Lebanese students make use of their learning style in order to achieve more academically?**
3. **Do Lebanese teachers take different learning styles into account when teaching a new concept?**
4. **Does knowing one's learning style help in developing effective study habits?**

CHAPTER 3

Results

The purpose of this work was to assess the Lebanese students' understanding of their learning styles as well as their perception of the role of teachers in acknowledging and taking into consideration such different styles. For this study, 300 questionnaires were distributed, and 260 were returned fully answered, while the rest was either partially answered or left blank. The results of the 260 questionnaires were analyzed qualitatively. This chapter is divided into 4 sections based on the following four questions "Do students know their learning style", "Do students make use of their learning style to achieve more academically", "Do teachers consider different learning styles while teaching" and "Do students have good study habits". The expectations of this study were to find trends between learning styles, study habits and mode of instruction.

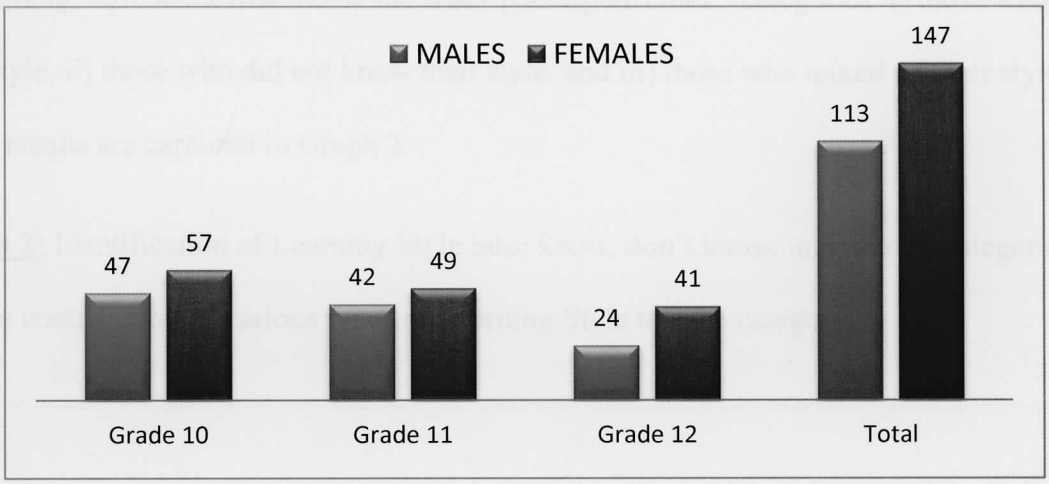
Demographic Information

The questionnaires were distributed to secondary students, grades 10 to 12 ranging in age between 14 to 18 years, from 5 different private schools. The questionnaires were filled on a voluntary basis. The demographic information about the participants is captured in the table and the graph below.

Table 1: Demographic table of the 260 participants.

	Grade 10	Grade 11	Grade 12	Total
Males	47	42	24	**113**
Females	57	49	41	**147**
Total	**104**	**91**	**65**	**260**

Graph 1: Demographic graph of the 260 participants.



We note that for grades 10 and 11, we had roughly equal numbers of males and females, but there were almost twice as many females than males in the 12th grade. Overall, we have 23% more female participants.

Do Lebanese Students Know Their Learning Style?

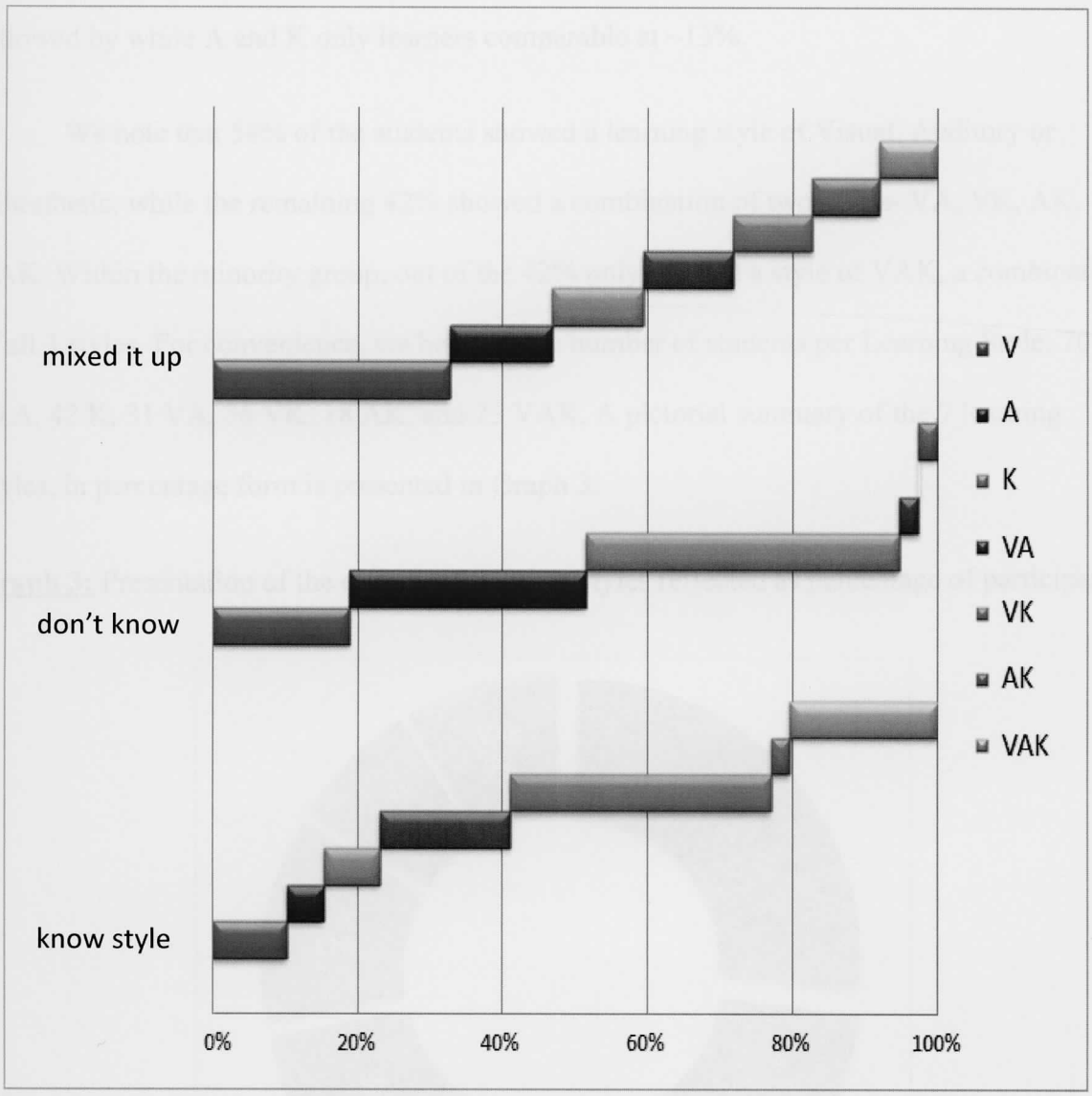
Learning style may be categorized as Visual, Auditory, Kinesthetic (VAK), or a combination thereof. Knowing one's learning style aids the person to efficiently learn new concepts and retain them. To aid the students in answering the questionnaire, a brief description of VAK styles was provided, based upon which students were asked to identify their own style (Appendix A, question 1).

From the results, we have 39 (15%) participants who appropriately identified their learning style -29 females and 10 males- a roughly 3:1 ratio.

We also have 37 (14%) students who were totally wrong in their identification of their Learning Style. While the rest 184 (71%) mixed their Learning Style up, for example, they thought they were a combination of VAK but they were VK (Visual Kinesthetic) or they thought they were V (Visual) while they turned out to be AK (Auditory Kinesthetic). So

while their identification was close, it was not completely accurate. We thus group the results of Learning Style identification by the study participants into 3 categories: i) those who know their style, ii) those who did not know their style, and iii) those who mixed up their style. These results are captured in Graph 2.

Graph 2: Identification of Learning Style into: know, don't know, and mix up categories, and the contribution of various types of Learning Style to each category.

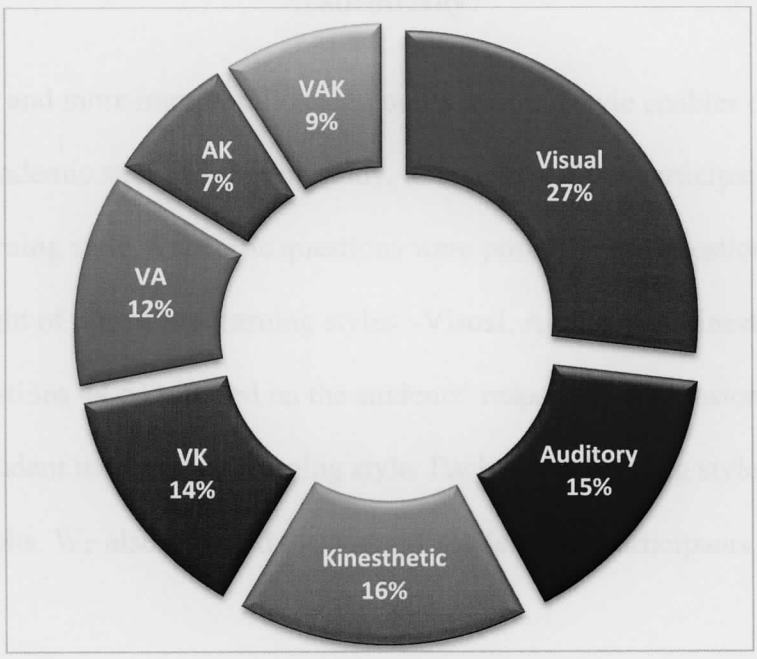


The graph above shows the participants and their identification of their Learning Style compared to their actual Learning Style assessed through the responses of the study. From the

graph we notice that the VK (Visual-Kinesthetic) learners formed the largest group among those who correctly identified their learning style, followed by VAK (Visual-Auditory-Kinesthetic) learners. The largest group who incorrectly identified their Learning Style were the K (Kinesthetic) learners, followed by A (Auditory) learners. Interestingly, none of the participants who are VKs (Visual-Kinesthetic) learners identified their learning style totally incorrectly. The majority of the VKs correctly identified their style and the rest mixed it up. The largest group who mixed up their Learning Style were the V (Visual) learners at 30%, followed by while A and K only learners comparable at ~13%.

We note that 58% of the students showed a learning style of Visual, Auditory or Kinesthetic, while the remaining 42% showed a combination of two styles- VA, VK, AK, VAK. Within the minority group, out of the 42% only 9% had a style of VAK, a combination of all 3 styles. For convenience, we here list the number of students per Learning Style: 70 V, 40 A, 42 K, 31 VA, 36 VK, 18 AK, and 23 VAK. A pictorial summary of the 7 learning Styles, in percentage form is presented in Graph 3.

Graph 3: Presentation of the different Learning Styles reflected as percentage of participants.



If we add all students who use Visual as either their sole learning style or in a combination style, V, VK, VA and VAK, we have 62% of the participants engaging in a visual mode of learning, (see Graph 3). Similarly, we find that 43% of the students take advantage of the Auditory means of learning, while 46% incorporate a kinesthetic approach to their learning style. Our results thus indicate that a greater percentage of the students make use of Visual cues, and incorporate more visual aids in a classroom.

The students who incorporate a kinesthetic approach to their learning style indicated that they prefer to be actively involved in activities and experiments. Of this kinesthetic group, (**119** out of which 42 are K and 77 are a combination of VK, AK, VAK), **31** students (31%) stated that they would prefer that their teachers explain a new concept through demonstrations, experiments or via projects. Instead, students were asked to give presentations and that only once or twice a year. For 12th grade students, even giving a presentation was not an option, as teachers felt that every available minute of a class should be used towards preparing the students to take the official governmental examinations.

Do Lebanese Students Make Use of Their Learning Style to Achieve More Academically?

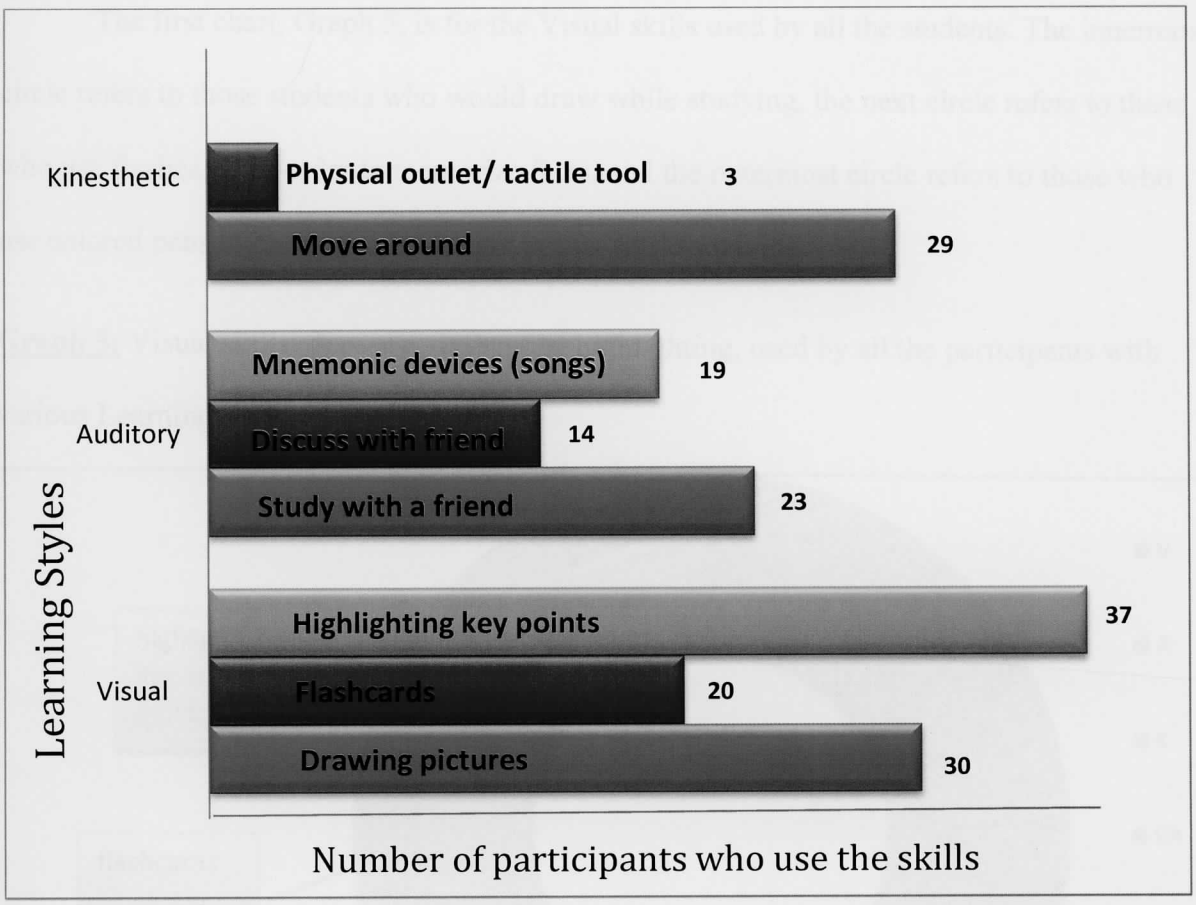
Knowing, and more importantly, using one's learning style enables the student to achieve higher academic standing. In this study, to ascertain if the participating students were utilizing their learning style, 8 specific questions were posed. These questions explore the study habits in light of one of the learning styles –Visual, Auditory or kinesthetic (see Appendix A, questions 44-51). Based on the students' responses, conclusions were drawn identifying if a student used his/her learning style. Each of the learning styles possesses specific study habits. We also reported the average grade of the participants in the subgroups.

From the 260 participants, 70 students (27%) were identified with a visual learning style. From this group of 70 students, 15 clearly knew their style. Further, only 3 out of these 15 were actively using the following characteristic visual habits: drawing diagrams or pictures, using flash cards to remember important points, color coding textbooks or their own notes, etc. The average of the 3 students is 73.69/100.

40 students or 15% of the total number of participants were identified with an auditory learning style. Of this group only 2 students clearly identified their style as Auditory. The questionnaire described Auditory study habits or skills to include, for example, studying with a friend, reading and discussing the material with others, as well as making use of mnemonic devices, such as of songs to aid memorization. The 3 students who utilized the above mentioned study habits actually identified their learning style as VAK – a combination of all styles. The average of these 3 students is 63.33/100.

In the Kinesthetic category, there were 42 students or 16% of all the participants, out of which, only 3 clearly identified their style as Kinesthetic. Of the students who were using Kinesthetic study habits – moving around while studying, or using a physical outlet such as a squish ball (a Tactile tool) - there were 3, and these 3 students identified their learning style as a combination of VK and VAK. The average the last 3 students was 70.33/100. Graph 4 below shows the number of students making use of their learning style by using characteristic study habits.

Graph 4: The number of students making use of their Learning Style and the associated study habits and skills of the particular style.



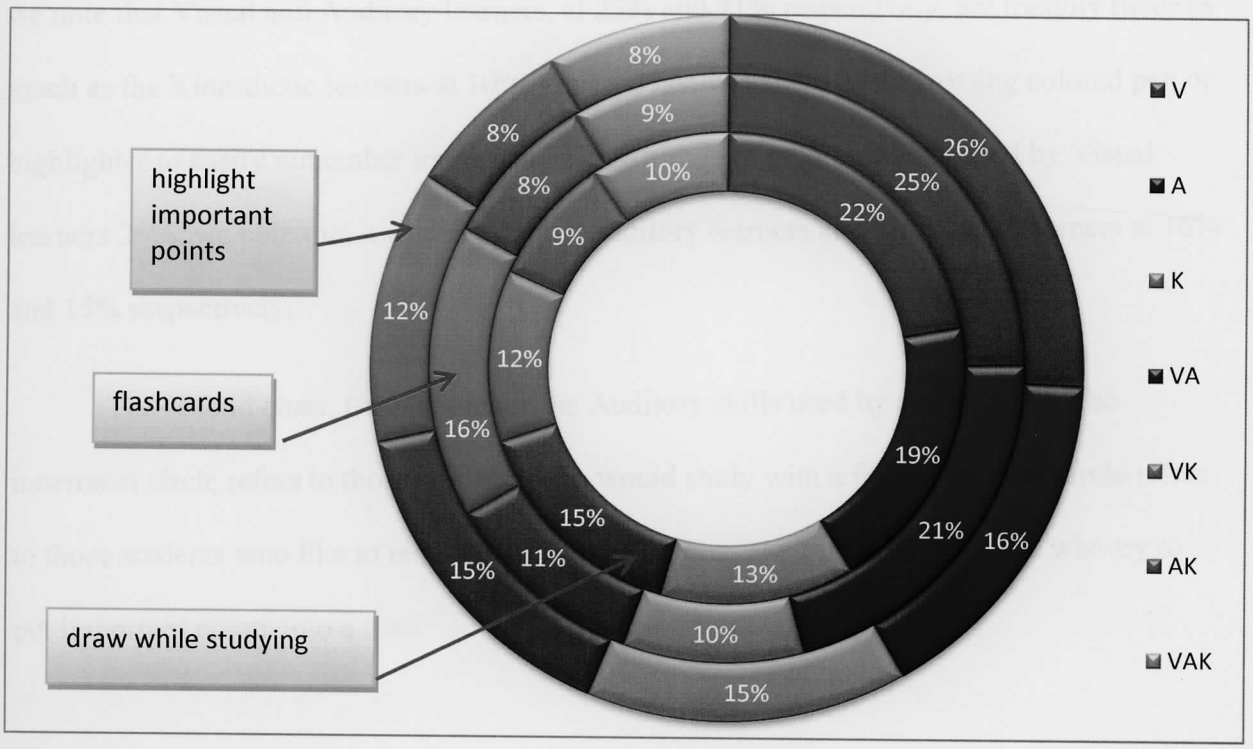
Interestingly, the students who were identified as Visual (lowermost group in Graph 4) appear to use the skills associated with their style more than those who were identified as either Auditory or Kinesthetic. This group of students, the Visual group, preferred that teachers explain a new concept in a visual way that aids comprehension, such as using PowerPoint presentations, visuals, or graphics. The results also indicate that all students use the Visual study habits almost exclusively.

A different and more informative presentation of the data is depicted in the following 3 charts; enumerated Graphs 5, 6 and 7. Here we plot, for each of the 3 learning styles – Visual, Auditory, and Kinesthetic- and their associated study habits or skills, the percentage

of the students who use these skills. This representation identifies not only the groups Visual, Auditory and Kinesthetic, but combinations thereof too.

The first chart, Graph 5, is for the Visual skills used by all the students. The innermost circle refers to those students who would draw while studying, the next circle refers to those who use flashcards in order to memorize facts, and the outermost circle refers to those who use colored pens to highlights important points while studying.

Graph 5: Visual skills, drawing, flashcards, highlighting, used by all the participants with various Learning Styles.



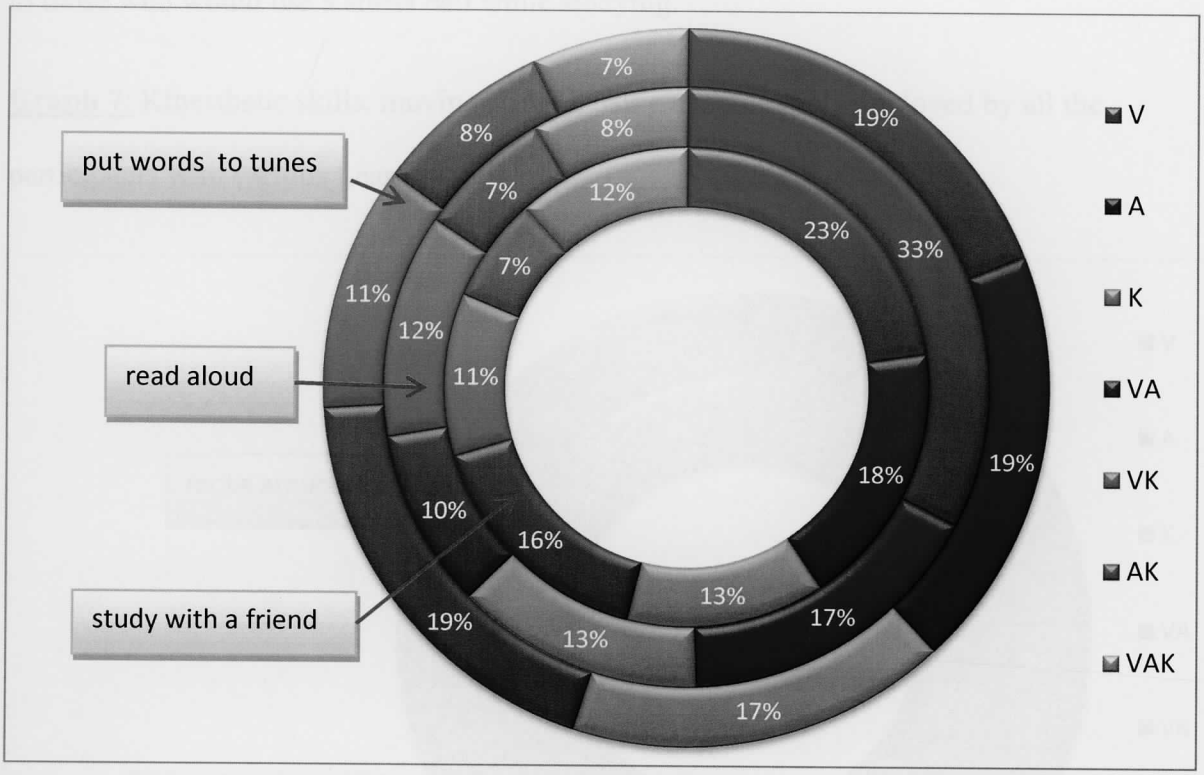
We notice in Graph 5 that all participants, independent of personal Learning Style, use visual skills although in different proportions. We also notice that the Visual learners are those who use the visual skills the most, followed by Auditory learners. Further inspection indicates that Visual and Auditory leaners, roughly to some extent, make use of drawings and flashcards to help them learn. On the other hand, the use of highlighting among Visual learners is 1.6 times more than in Auditory leaners. There are also certain similarities in the

usage of the 3 skills for K and VA learners who use flashcards less than they use drawings or highlighting, while VK use flashcards most and their use of drawings or highlighting is somewhat similar to that of K and VA students. The use of the 3 skills is similar for AK and VAK learners, and also the percent usage of the 3 skills within each of these two styles is roughly the same.

In the case of drawing pictures and diagrams as a learning aid, Kinesthetic learners are only 13%, whereas the Visual learners are the majority at 22%, followed by the Auditory learners at 19%. For the use of flash cards as a learning skill to remember important points, we note that Visual and Auditory learners, at 25% and 21% respectively, are roughly twice as much as the Kinesthetic learners at 10%. And the last visual study skill –using colored pen or highlighter to easily remember important points- although predominantly used by Visual learners 26%, we note that it is also used by Auditory learners and kinesthetic learners at 16% and 15% respectively.

The second chart, Graph 6, is for the Auditory skills used by the students. The innermost circle refers to those students who would study with a friend, the next circle refers to those students who like to read aloud, and the outermost circle refers to those who try to put important points into a tune.

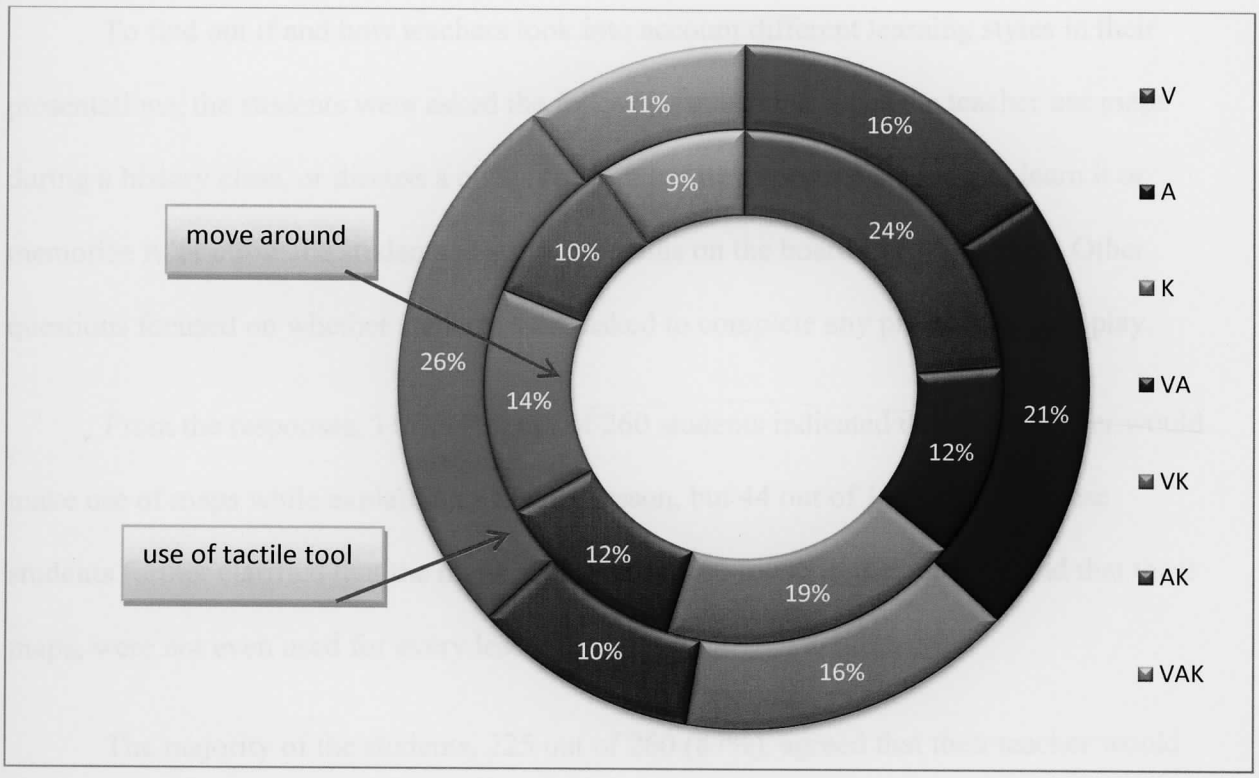
Graph 6: Auditory skills, study with a friend, read aloud, and put to music, used by all the participants with various Learning Styles.



The graph reveals the following interesting points. Although studying with a friend, explaining to each other, listening to someone read the lesson, and making up rhymes or a song to remember key points, are predominantly considered auditory skills, here we note that they are either equally used or used more by Visual learners. For example, "studying with a friend" and "explaining to each other" are used more by Visuals learners (23%) than Auditory learners (18%) followed by Visual Auditory learners (16%). The second skill, having someone read the lesson to the person, is used 33% by Visuals, roughly twice than by Auditory learners- 16%. Making up rhymes or songs in order to remember key points of a lesson is equally used by Visuals and Auditory learners- 19%, followed closely by Kinesthetic learners- 17%.

The third chart is for the kinesthetic skills used by the students. The innermost circle refers to those students who would move a lot while studying and the outermost circle refers to those who would use a stress ball while studying.

Graph 7: Kinesthetic skills, moving around, using a tactile tool, employed by all the participants with various Learning Styles.



In Graph 7, we notice that Visual students have a preference to move around while studying, more so than a Kinesthetic person, while a kinesthetic person prefers the use of a tactile stimulus more so than a visual person. Also the group that uses a stress ball while studying, are mostly the Visual Kinesthetic 26%, followed by the Auditory learners 21% and not all by Auditory Kinesthetic learners.

Do Lebanese Teachers Consider Different Learning Styles While Teaching?

Teachers, in addition to their students, should also be aware of differences in learning styles. Realizing that students learn differently, teachers may explain a new concept in a variety of ways - pictorially, interactively through questions and answers with the class, through a discussion of a web based clip or movie-thus reaching out to the whole class.

To find out if and how teachers took into account different learning styles in their presentations, the students were asked the following questions. Does the teacher use maps during a history class, or discuss a civics concept before expecting students to learn it or memorize it, or allow the students to solve problems on the board in a Math class. Other questions focused on whether students were asked to complete any projects, or role play.

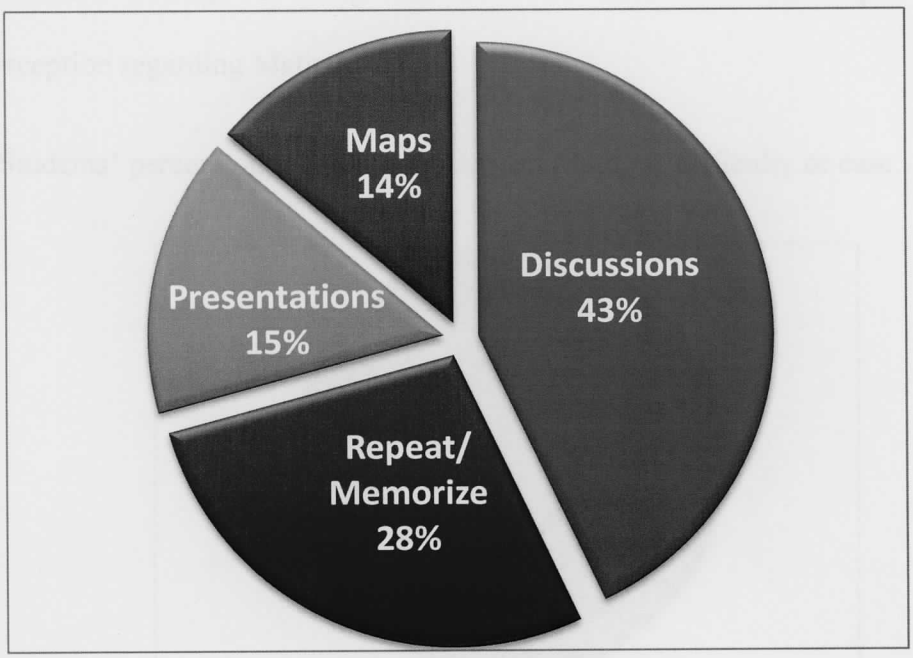
From the responses, 115 (44%) out of 260 students indicated that their teacher would make use of maps while explaining a history lesson, but 44 out of 115 (39%) of these students further clarified that the maps used, were those found in the textbook and that these maps, were not even used for every lesson.

The majority of the students, 225 out of 260 (87%), agreed that their teacher would discuss a new concept or lesson. A few, 55 out of 225 (24%), added that their teacher would explain a lesson and sometimes have a class discussion with time for questions and answers. The students of one school, who form 105 out of 260 (40%), noted that they have discussions and "question and answer" sessions in their civic class and they all enjoyed the topic even if they had to eventually memorize large amounts of information as long as the teacher made the class periods enjoyable. The teacher of this civic course often used PowerPoint presentations leading to the discussion sessions.

For the majority of the students, 150 out of 260 (58%), learning by heart is the only way to study Arabic History. Studying Civics by heart comes second close at 53%. For most of the students, a positive result such as a good grade more than compensated for the chore of memorizing subjects that were hard for them to understand and took a lot of time to prepare. Others, (10 out of 260), when faced with a hard topic, gave up, did not study or attempted to cheat on tests.

None of the students mentioned that their teachers would engage the class into short role plays in Arabic History class to relive the events from their point of view. Also debates were used neither in Arabic History nor in Civics- just read and tell. In addition, not many presentations were used; 81 students out of 260 stated that their teacher would ask them to do a presentation, but 30 explained that it was done only once a year. Grade 12 students stated that they don't have presentations at all this year because the teacher wants to prepare them for the governmental exams. Graph 8 sums up the 4 major teaching methods used y teachers.

Graph 8: Various teaching methods used by teachers as defined by students.



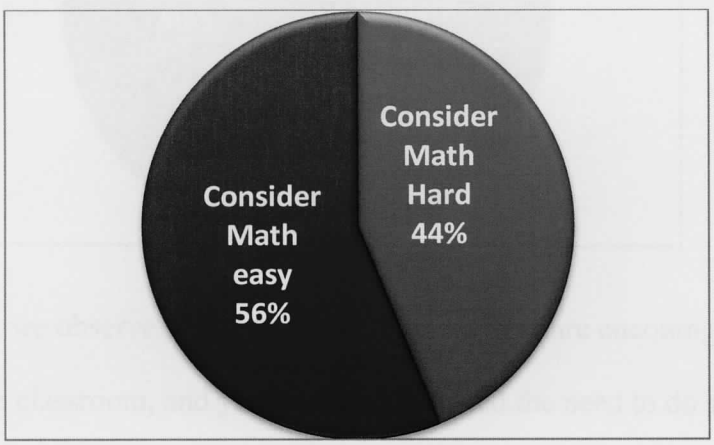
Teachers do utilize discussions (43%) in class as a mean to transmit information, although, as perceived by the students, these discussions are more verbal than visual. Visual aids (14% maps and 15% presentation), when used, only account for 29%. Students perceive their teachers as repeating the same explanations again and again, 28% of the time, reinforcing the idea of memorization to the students as a means of learning (see Graph 8).

We now examine how students approached different subjects in the context of their teachers teaching style.

Math

Math is considered a hard subject for 114 (44%) out of 260 students and only 18 out of 114 of them has a Math tutor. 28 out of 260 are failing in Math- even though 10 of them have a tutor but are still failing based on their given grades. 15 out of 260 are barely passing with 2 out of 15 having a tutor. 9 out of 260 are average to good in Math and only one of them has a tutor. Interestingly, the one student with the high 95 average, although does not have a tutor, found out that by studying alone at home with music, helps her do better. She is a kinesthetic learner although she thought she was VA (Visual Auditory). Graph 9 shows the students' perception regarding Math.

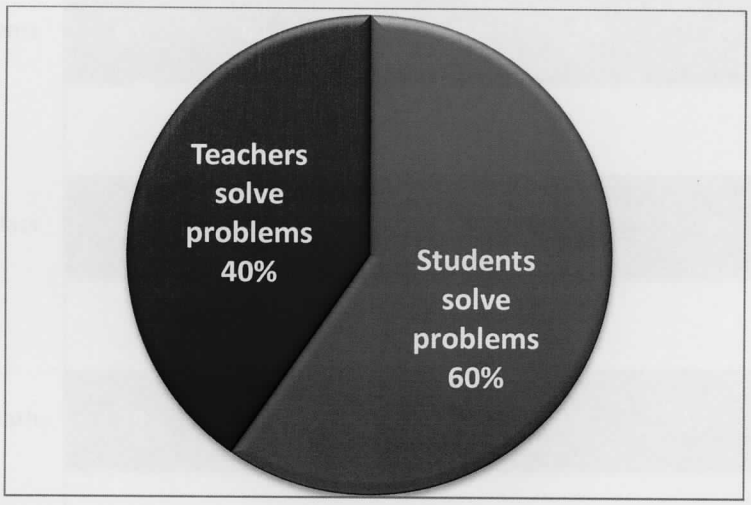
Graph 9: Students' perception regarding the subject Math, its difficulty or ease.



From the graph, 56% of the students consider Math to be easy. This is an overall statement from the whole group, and later on we further refine and present the responses of the students in light of their individual Learning Style (see Graph 11).

All the participants claim that they are content with their Math teachers. 155 out of 260 students state that the students solve problems on the board, whereas some of them, 55 out of these 155 students, explained further through such comments: In algebra class, students would solve new problems on the board; but in geometry class, the teacher would do most of the solving. 154 out of 260, more than half of the students, claimed that the teacher would solve the problems but would not let them solve the problems on the board. Several students, 30 out of 155, even claimed that some teachers would never give a student with low Math grades an opportunity to solve a problem on the board. The chart below, Graph 10, demonstrated students' point of view regarding problem solving in the classroom as a means of leaning Math.

Graph 10: Students' evaluation of Math problem solving in a classroom.

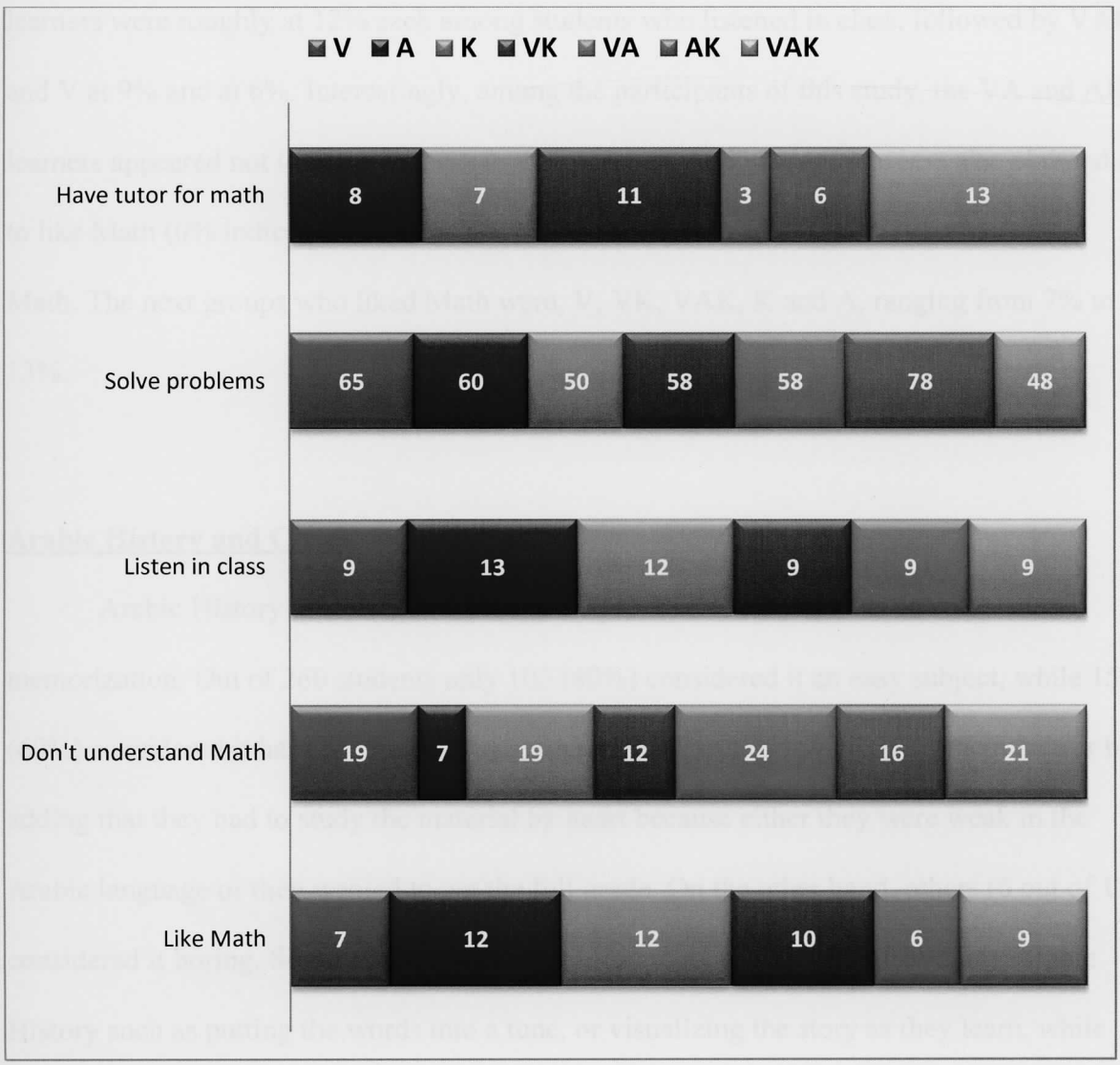


From Graph 10, we observe that 60% of the time students are encouraged and allowed to solve problems in the classroom, and yet students expressed the need to do so more. Again,

these results are averaged over different schools, and may not be a representative percentage in each and every classroom.

We next study how students with different Learning Styles perceive, study and learn Math. We classify the responses into the following five categories: like Math, don't understand Math, listen in class, solve problems, and have a tutor for Math. The results are presented in Graph 11, where we portray the percentage of responses to one of the 5 categories within each Learning Style

Graph 11: The percentage of how students perceive and study Math delineated within each of the Learning Styles, V, A, K, VK, VA, AK and VAK.



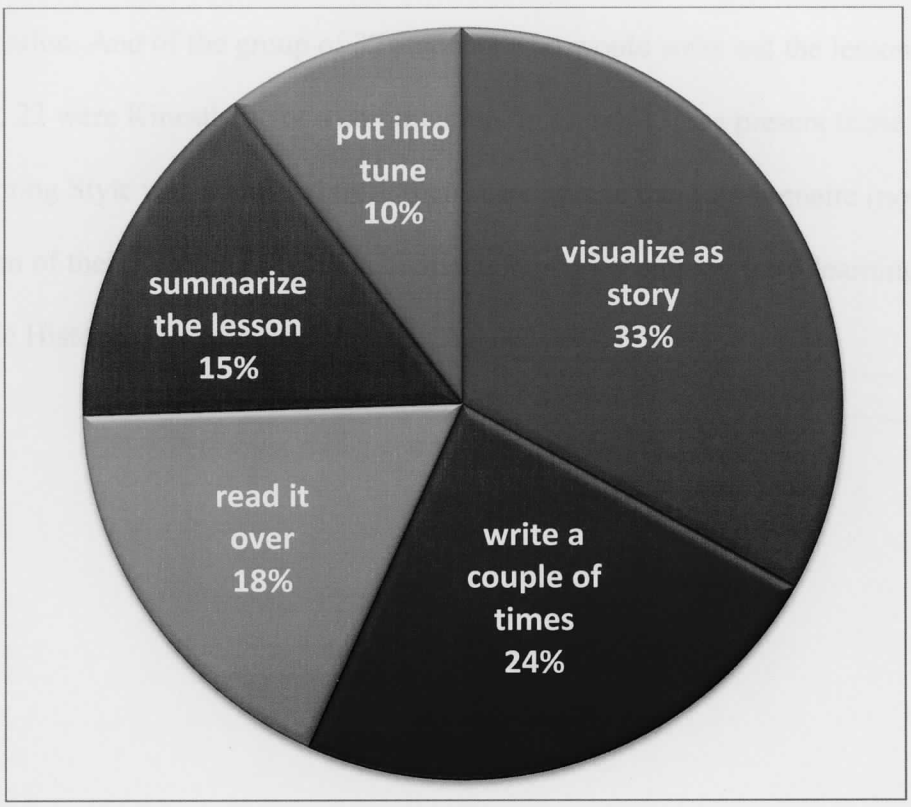
In Graph 11 we indicated the percentage of students within each Learning Style, and their responses to the five questions asked. From Graph 11, it is clear that what students think helps them the most in learning Math is solving problems. In fact, for all the Learning Styles reported here, the percentage of students within each style who considers problem solving as very important of roughly 50% or higher (VAK was the lowest at 48%). Not that many students had tutors, with VAK learner among this group of 260 having the highest percentage of tutors, at 13%. Followed by A, K and AK at 8, 7 and 6 %. The percentage of VK students who also claimed not to understand Math is 11 %. Among the students who answered that they did not like Math, the largest group was the VA learners at 32%, followed by VAK and K at around 22%, V at 19%, AK at 17%, VK at 10% and A learners at 8%. The A and K learners were roughly at 12% each among students who listened in class, followed by VAK and V at 9% and at 6%. Interestingly, among the participants of this study, the VA and AK learners appeared not to listen in class to their teacher. And, the AK learners also claimed not to like Math (0% indicated that they like Math), while only 6% of the VA learners liked Math. The next groups who liked Math were, V, VK, VAK, K and A, ranging from 7% to 13%.

Arabic History and Civics

Arabic History is considered a tough subject because it depends on rote memorization. Out of 260 students only 103 (40%) considered it an easy subject, while 157 (60%) considered it hard for they have to memorize. 42 out of 157 clarified their answer by adding that they had to study the material by heart because either they were weak in the Arabic language or they wanted to get the full grade. On the other hand, others (6 out of 157) considered it boring. Some of the students have found their own way of studying Arabic History such as putting the words into a tune, or visualizing the story as they learn, while

others would summarize the main points and study, or would read aloud a couple of times or would write out the lesson a few times. The graph below, Graph 12, summarizes how the group of 260 students uses the following learning aids for Arabic History: visualize as a story, write down, reread, summarize, and put to tune.

Graph 12: How students study Arabic History independent of their Learning Style.

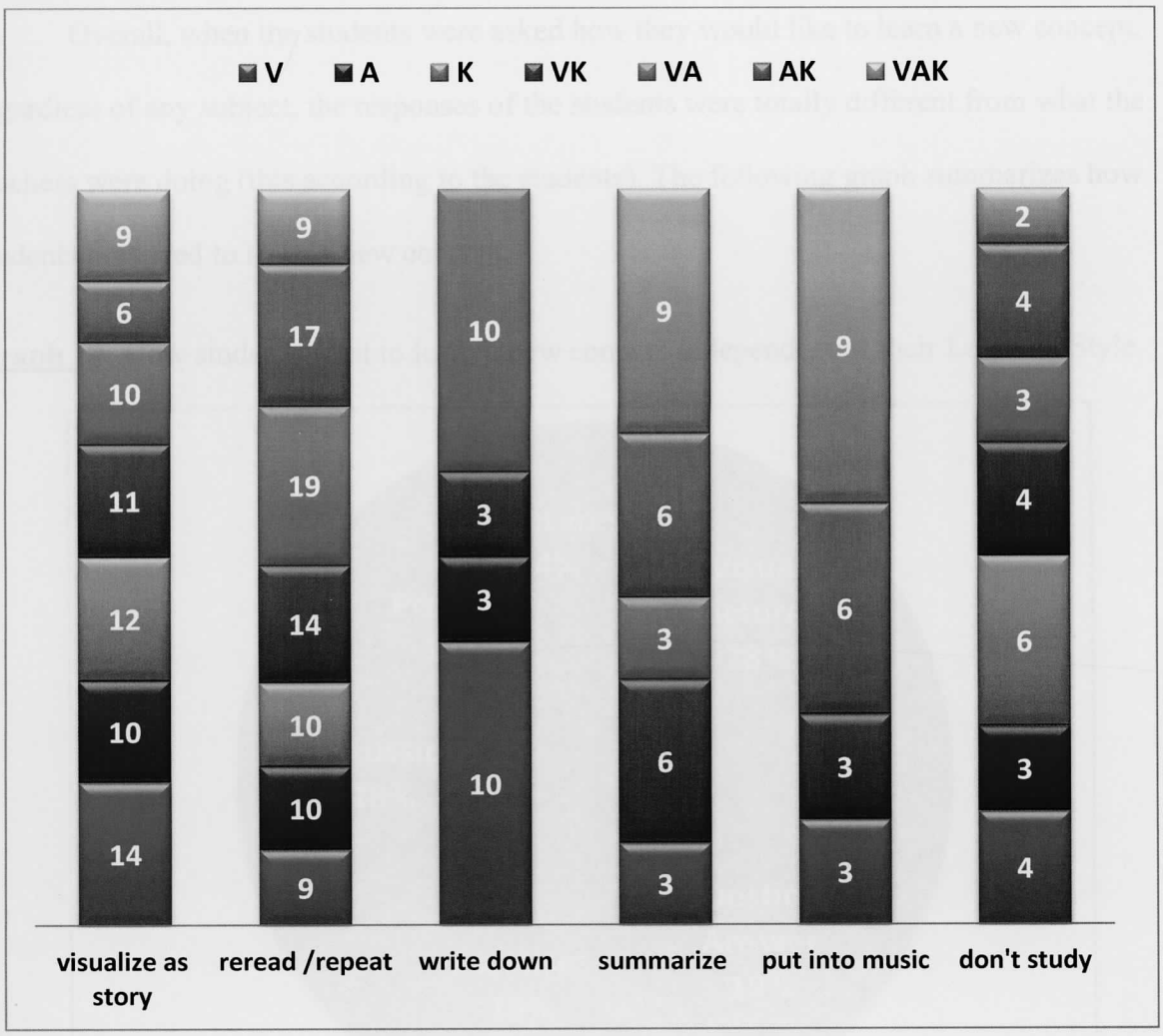


The results shown in Graph 12 are combined for all Learning Styles. Visualization of the material as a story was the skill used most by all the students, at 33%, followed by writing out the story a couple of times to help retain the details, at 24%. 18% read the material over several times, 15% summarized the lesson to better remember it, and 10% put the set the material to a tune in order to remember.

Upon further examination of the data, one observes that students who were having difficulty with studying Arabic History, 157 out of 260, some of them were studying

according to their main Learning Style as identified by the questionnaire. For example, out of the 16 students who would put the text to be memorized to a tune, 6 students were a combination of Auditory style. Out of the 28 students who would read the text and study, 10 were a combination of Auditory, while the majority -18 out of 28- was a combination of Visual. Out of the 52 students who would learn by visualizing the story, 42 were Visual or a combination. 24 students would summarize the lesson, and of this group 12 were Kinesthetic or a combination. And of the group of 37 students who would write out the lesson as a means of studying, 22 were Kinesthetic or a combination. In Graph 13, we present those students whose Learning Style was identified from their responses to the questionnaire (not self-identification of their Learning Style) and indicate how they employ the 5 learning tool to study Arabic History.

Graph 13: Use of the five learning tools for studying Arabic History by students who use their own identified Learning Style.

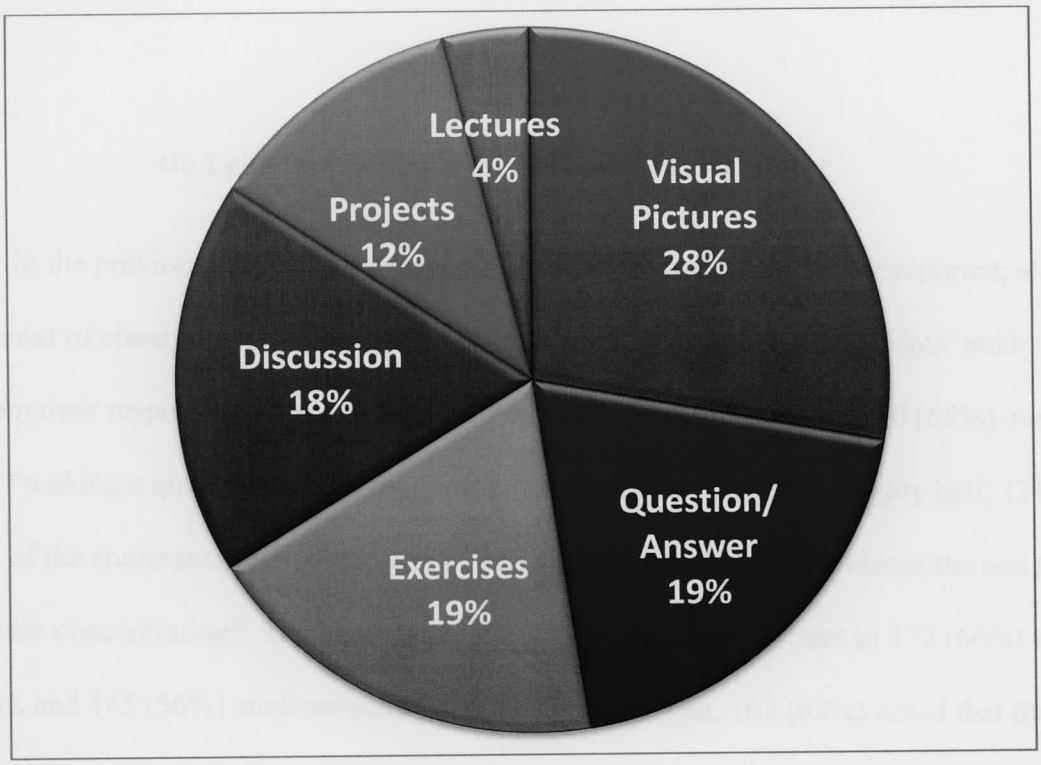


The Visual learners appear to employ all 5 tools, with more of them using tools with a visual component, i.e. visualization as a story, writing it down and rereading. Summarizing and putting it to a tune and not necessarily visual activities. Visual Kinesthetic learners also tend to use all 5 skills. VA, AK and VAK learners use 4 skills out of the 5. AK and VAK learners use the same 4 skills, namely visualization, repetition, summarization, and putting information to music. VA learners also use 4 of the skills, and these are: visualization, repetition, writing it down, and summarization. Auditory learners use visualization and

repetition comparably, and to a lesser degree employ written repetition. Kinesthetic learners appear to employ only visualization and repetition as study skills to learn Arabic History.

Overall, when the students were asked how they would like to learn a new concept, regardless of any subject, the responses of the students were totally different from what the teachers were doing (this according to the students). The following graph summarizes how students preferred to learn a new concept.

Graph 14: How students want to learn a new concept independent of their Learning Style.



The results from Graph 14 clearly indicate that students prefer to learn a new concept through the use of visual aids, 28%. Several students further explained their choice by stating that pictures do leave an impression and through the use of the visuals they do remember the key concepts of the lesson. Question and Answer and Exercises follow at 19% each. Learning through Question and Answer students felt that by having their questions answered – and thus their misconceptions corrected- they can understand a concept better and more efficiently. Doing Exercises also test one's knowledge and comprehension of the subject, and

furthermore, practicing more, i.e. doing more Exercises, students felt that they could gauge their mastery of the subject and prepare for tests. Discussing a new concept came at a close 18%, and again, through Discussions, students can get feedback about points that they are struggling with. Doing Projects was another way to learn and students valued this approach 12%. Clearly certain learning methods are more adaptable to different subject. For example, the impact of doing more Exercises is more in Math and sciences, whereas doing a project would be more suited for a History class. On the other hand, the least desired way to learn a new concept was through lecture only, 4%.

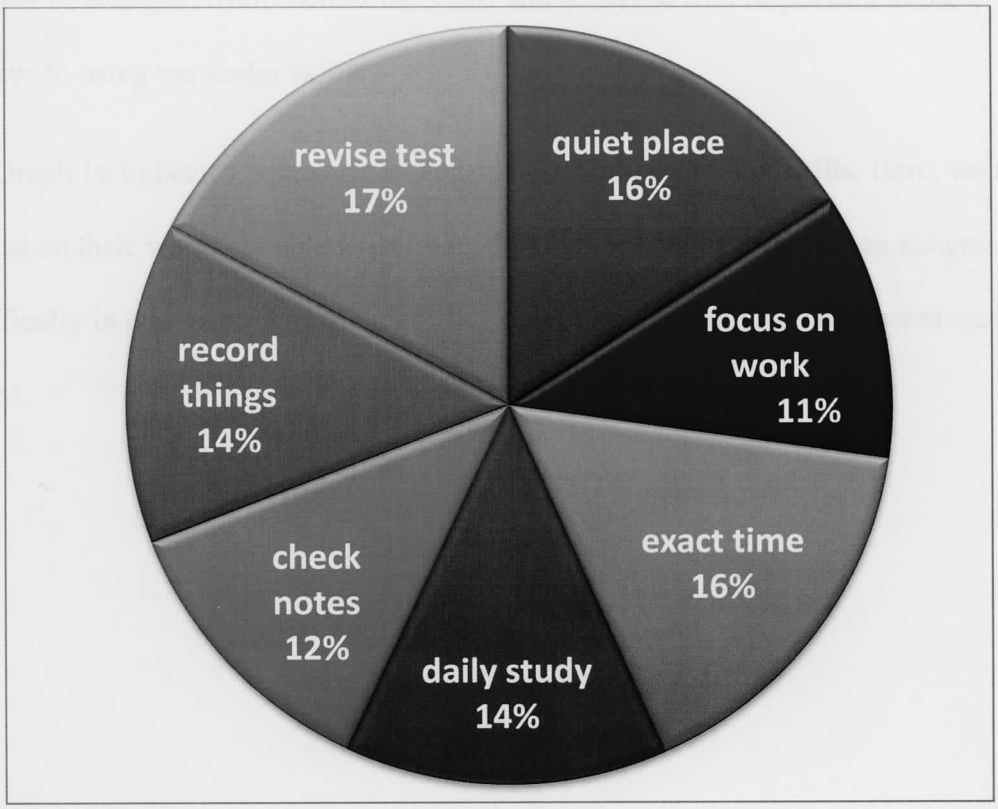
Do Lebanese Students Have Good Study Habits?

In the previous section, some aspects of students' study habits were reported, albeit in the context of classroom experiences. Here, we further investigated the students' study habits, and from their responses, we found that the study skill used the most, by 170 (65%) out of 260, is "seeking a quiet place to study in order to concentrate better". Roughly half, 121 (47%), of the students were "able to completely focus on their work", whereas the rest had "difficulty concentrating". The exact time of day to study was important to 172 (66%) of the students, and 145 (56%) students studied on a daily basis. But, 162 (62%) noted that they did not feel they had enough time for their social life if they to study daily and often end up cramming before a test. A total of 158 (61%) of the students resorted to this mode of study.

The "note taking" skill appeared to be the most popular one. 130 (50%) students would check their notes for missing information and 146 (56%) would record everything the teacher said. 139 (53%) students would listen to the teacher but not record everything. Of this particular group 20 identified themselves as auditory and 40 as a combination of Auditory Learning Style.

In addition to studying skills, test taking skills play an important role in how students perform. 212 (82%) students indicated that they study in a haphazard manner, while 222 (85%) claimed that they miss points due to careless mistakes. Only 63(24%) students successfully estimate how much time they should allot to each question, whereas 183 stated that they revised their test answers if time was available. We summarize the various different skills used by students in studying and taking a test in Graph 15.

Graph 15: The different skills used by students for studying and test taking.



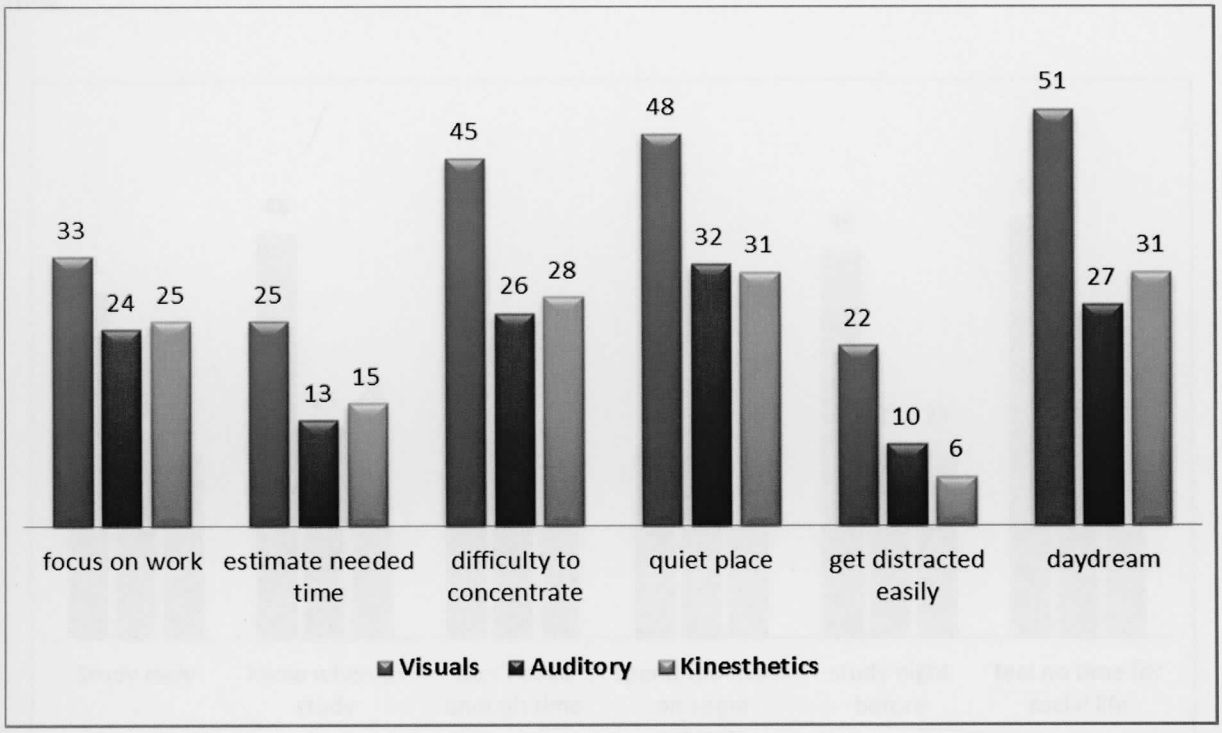
Graph 15 shows that students consider revising a test as one of the most important aspects in obtaining a good grade, and they realize it is a skill they need to implement (17%). Closely follow, at 16%, identifying a quiet place to study as well as the best time to study. For each individual, that time will be different, and thus knowing which particular time is best for one is important. Studying daily as well as recoding information is each at 14%. Related to recording information is checking over one's notes, at 12%. Focusing on work

comes in at 11%. This distribution was for the whole group of students, independent of their Learning Style.

We next refine these results by tabulating study skill characteristic of a particular Learning Style versus students using these skills. We note that for the next 4 graphs, Graphs 16, 17, 18 and 19, we present that data for the learners with sole styles, V, A and K. The combination Learning Styles are omitted for clarity. Among the 260 participants, there were 70 Visual, 40 Auditory, and 42 Kinesthetic learners. In the following 4 graphs, we indicate the number of students, from each of the V, A, and K styles, who responded in the affirmative to using particular skills.

Graph 16 indicates how various students use **Concentration skills.** Here, we ask if they focus on their work, are able to estimate the time needed to complete an assignment, have difficulty in concentrating, can identify a quiet place to study, get distracted easily, and daydream.

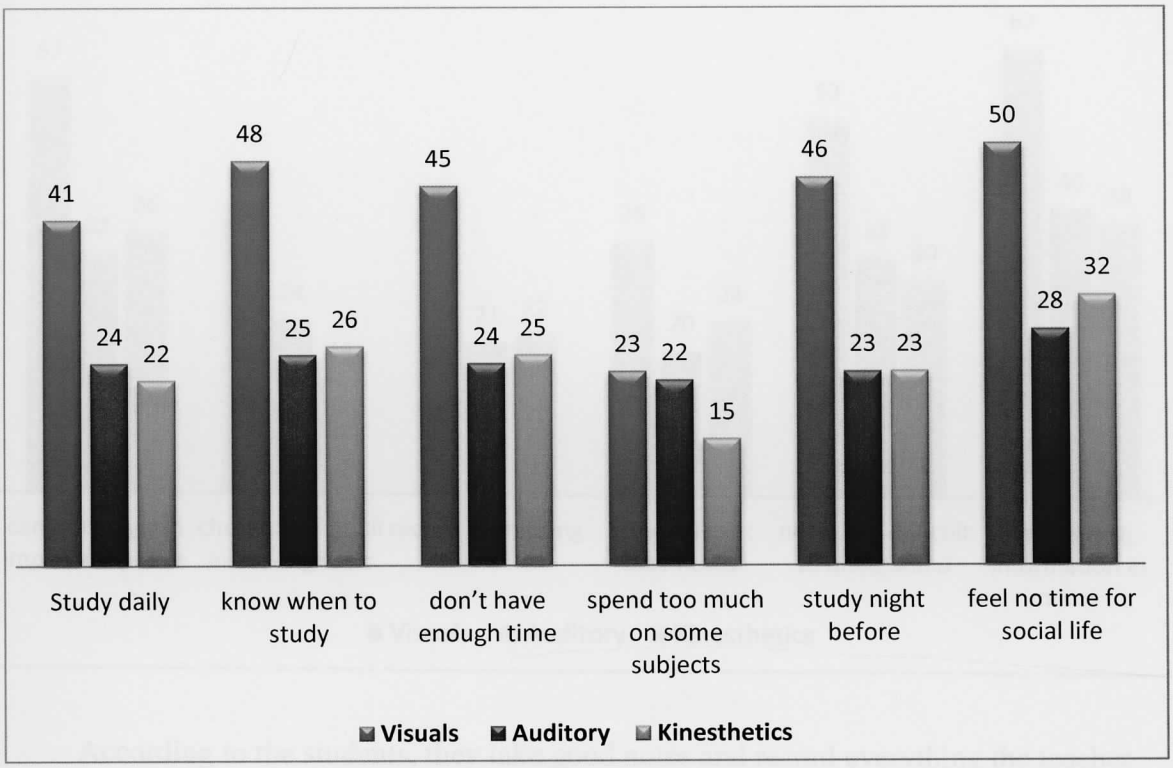
Graph 16: How the V, A, and K learners use different Concentration skills.



We notice that the Visual learners use the 6 Concentration skills more than the A and K learners. Roughly the same number of A and K students use the same 6 skills. Among the V learners, daydreaming came first, followed by identifying a quiet place to study and concentration. The last two, a quiet place and concentration, are related, as a quiet place allows one to concentrate. The responses also indicate that A and K learners focus on their work, concentrate, and seek a quiet place to study roughly to the same extent. Visual learners appear to be the most easily distracted, followed by A and then K learners.

Graph 17 shows how **Organizational skills** are used by asking if students study daily, know when to study, have enough time to study, spend too much time on some subjects, study only the night before , and if they don't have enough time to socialize.

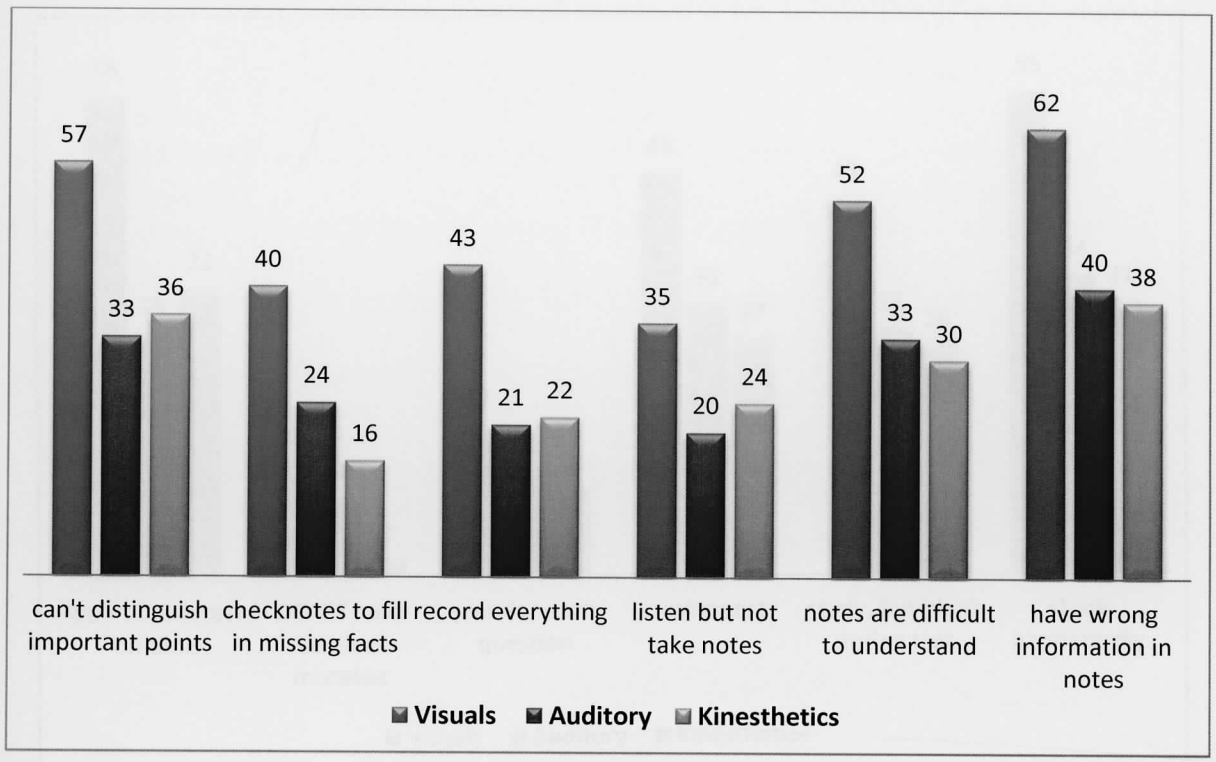
Graph 17: How the V, A, and K learners apply certain Organizational skill to manage their time.



Auditory and Kinesthetic learners appear to use the Organizational skills – studying daily, knowing when to study, not having enough time to study, study the night before - to the same extent. However, there is a difference between A and K learners, A learners spend more time on some subjects than K learners. In fact, V and A learners indicated, to the same extent, that they spent too much time on certain subjects. Except to the last mentioned skill, Visual learners again used the Organizational skills the most. An interesting point is that all students indicated that they don't have enough time to socialize.

Graph 18 indicates how students **Listen and Take notes**. The students were asked if they can distinguish important points, check notes to make sure they have not missed anything important, record everything, listen but not take notes, find their notes difficult to understand, and have the wrong information in their notes.

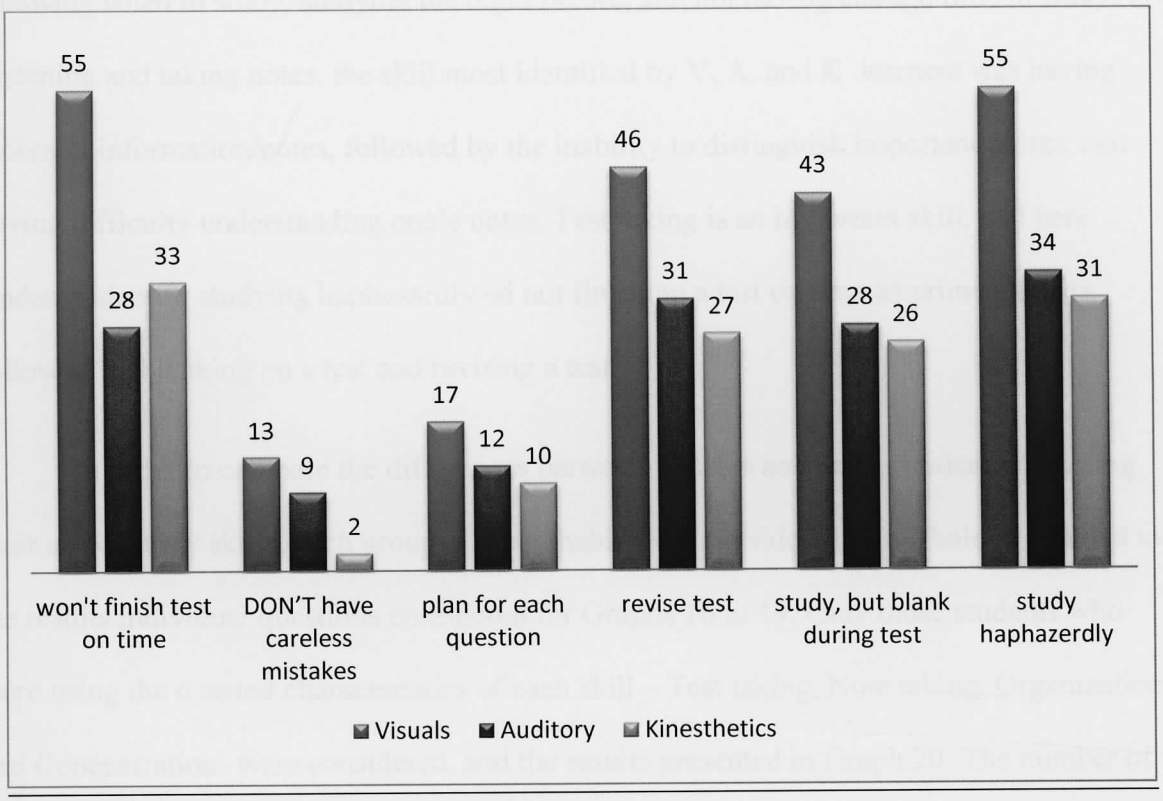
Graph 18: How the V, A, and K learners use Listening and note taking skills.



According to the students, they take good notes and record everything the teacher mentions. Yet, from their responses, we notice that more students per V, A and K style indicate that notes are hard to understand, and they have wrong information in their notes, and they cannot distinguish important points. A certain number of students did check their notes to fill in missing information. We also notice that some students listen in class but do not take notes. Interestingly, more K learners do not take notes and more of them cannot distinguish important points, compared to A learners. These two responses may be related; if one does not have a record (words, graphs, drawings) of a lesson, they may have a more difficult time defining the important points. All students appear to have wrong information in their notes.

Lastly, Graph 19 shows the **Test taking skills** of the various learners. Here we ask if they are able to finish their test on time, don't make careless mistakes, plan time for each question, revise test, study yet blank or freeze on the test, and if they study haphazardly.

Graph 19: How the V, A, and K learners use different Test taking skills.



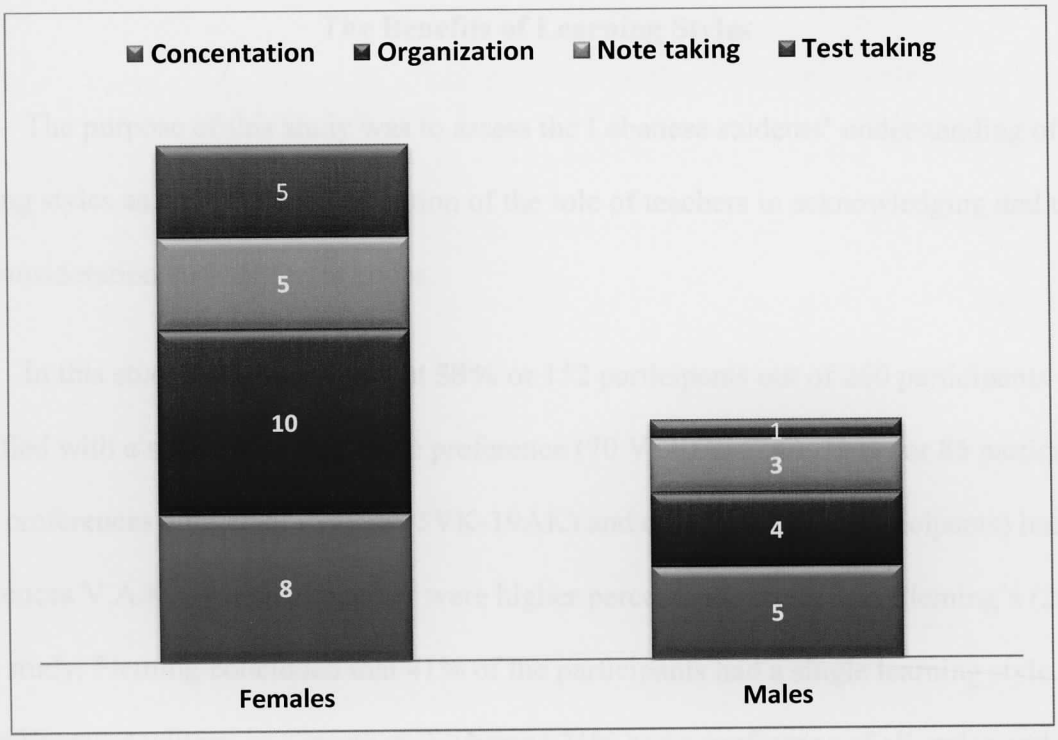
We notice equal responses from Visual learners regarding studying haphazardly and not finishing their test on time. Looking at the responses of the A and K learners to these two skills, we see that they are comparable. Revising a test and blanking or freezing on a test comes next for V learners, distantly followed by planning for each question and not having careless mistakes. The responses for the A and K learners were more even for all the questions asked except for not having careless mistakes. Here, we see very few responses from K learners. Overall, students appear to study haphazardly, blank or freeze on a test and not finish a test on time.

From Graphs 16, 17, 18 and 19, we see that Visual learners are using the specified study skills, Concentration, Organization, Listening and note taking, and Test taking, more than the other learning styles. V, A, and K learners use the following Concentrations skills roughly equally: Daydreaming, difficulty in concentrating, and finding a quiet place to study.

The 3 skills in Organizing one's time that are equally used by V, A, and K learners are: Knowing when to study, studying the night before, and not having enough time to study. For Listening and taking notes, the skill most identified by V, A, and K learners was having incorrect information/notes, followed by the inability to distinguish important points, and having difficulty understanding one's notes. Test taking is an important skill, and here students identify studying haphazardly ad not finishing a test on time as prime choices, followed by blanking on a test and revising a test.

In order to compare the differences between females and males students regarding their use of study skills, each group of study habits was considered as a whole in contrast to the results individual questions considered for Graphs 16 to 19. Only those students who were using the 6 stated characteristics of each skill – Test taking, Note taking, Organization, and Concentration- were considered, and the results presented in Graph 20. The number of students is indicated in the relevant box.

Graph 20: The differences between females and males regarding the study skills Test taking, Note taking, Organization, and Concentration.



We note that Concentration and to a similar extent Note taking are study skills comparably used by both female and males students. On the other hand, the female students in our study have better Organization and Test taking skills. Interestingly, there is a connection between Organization and Test taking. Students who study clearly and in an orderly manner answer questions on a test, can spot their mistakes and correct them, resulting in a higher test grade.

CHAPTER 4

Discussion

The Benefits of Learning Styles

The purpose of this study was to assess the Lebanese students' understanding of their learning styles as well as their perception of the role of teachers in acknowledging and taking into consideration such different styles.

In this study, we found out that **58%** or 152 participants out of 260 participants identified with a single Learning Style preference (70 V, 40A, 42K), **33%** (or 85 participants) had 2 preferences altogether (31VA-35VK-19AK) and only **9%** (or 23 participants) had 3 preferences V.A.K. , which altogether were higher percentage results than Fleming's (2007), In his study, Fleming concluded that 41% of the participants had a single learning style (either Visual, Auditory or Kinesthetic) whereas 21% had a preference of all styles and therefore were identified as VARK. This difference could be explained due to the differences in sample size. This study had 260 participants whereas Fleming's is a website established in 2001 and visited by over 28074 so far. In general, the larger the sample the more reliable is the results. Moreover, Fleming's participants were those who were interested in learning styles in the first place.

Moreover, N. Fleming (1995) argues that a difference of 1 or 2 points may not be enough to clearly distinguish between Learning Style preferences. While any survey does carry a margin of error by few points, for our analysis, we consistently used the highest score a participant scored, and distinguished among various preferences even if there was only 1 point difference. So again a larger sample could have overcome the issue of very close scores.

From the 260 students who took the survey, only 39 – 15%- correctly identified their learning style. This is both surprising and of concern. The definitions of the styles were provided, and yet most students had difficulty identifying their correct learning style. While the students were from grades 10 to 12 and thus old enough to have a good sense of their capabilities, it may be that they did not carefully read the descriptions provided on the questionnaire, or were not sure how to respond to the idea of identifying this concept of "learning style". We hope that even if the students did not correctly identify their learning styles, exposure to the questionnaire at least made them aware of learning styles and the potential impact of correctly using one's style to attain high academic achievements. From the responses that were written, **95** students claimed it made them think about themselves and their studies. So the survey appeared to be beneficial and thought provoking to the students.

As one can recall from the results we had 29 females and 10 males who identified their learning style correctly. This may lead one to deduce that females may be more aware of their learning styles. Or, the female participants were more careful in answering the questionnaire. Thus while it is noteworthy, this sole study is not comprehensive enough to deduce gender bias in identifying one's learning style. Moreover, as Le Cornue (1999) and Cooper (1969) stated, gender does not play a major role when it comes to learning styles.

Most, if not all of the participants have not heard of learning styles, which might be another reason why so many of them got their style mixed up. So it would be a wise move to take the time, in the beginning of the school year, and explain to students about learning styles and the strengths and benefits of each style, help them to take the test, and then discuss the outcome and how each element would help them to learn better. Hodgin (1997) totally supports this; in fact he sees this as one of the most important ways to achieve higher academically. Hodgin wants teachers to stress the point that there are no right or wrong learning styles and each style is as important as the other.

Learning Styles and Academic Achievement in Lebanese Schools

Learning Styles can have an impact on a student's academic achievements, as thoroughly researched by Dunn. According to Dunn (2009), knowing and using one's Learning Style indeed converts to better academic performance, as the student is now guided both in his/her approach to studying and also while taking the test. Hodgin and Wooliscroft (1997) refer to an academically weak student- Eric- who soon learns and excels academically when his teachers teach him according to his learning style. Thus, even weak students can learn by using their learning preferences.

This study was done on a small group, so a future quantitative analysis on a bigger sample needs to be done, so as to test the significance of knowing one's learning style and academic achievement.

The class average of the 39 students who correctly identified their learning style was 70.28/100, while the class average of 37 students who were totally incorrect in identifying their style was also 70.28/100. We note that the average grades reported comprise multiple subjects, ranging from Math to Science to History and Civics. So while the averages are the same, the grades for different type of classes, Math versus Civics, two subjects for which the survey asked for grades, are different. Further studies should ask the grades of all the classes the participants take, and monitor the participants' performances in high school, grades 10, 11 and 12, to explore the correlation of grades and retention of subject matter and, more importantly, the ability of the students to apply information acquired in e.g. geometry class in grade 10 to analytical geometry studied in grade 12. We again stress that the aim of this study is to find trends between learning styles, study habits and mode of instruction.

The Role of the Student

In our study, the questionnaire administered to the participating students briefly defined each Learning Style and preference. As mentioned earlier, only 39 of the participants correctly identify their style. This may be due to many factors ranging from some misinterpretation of the definitions to not paying attention to the questions; it could also be due to the fact that English is not their first language, although a pilot study was conducted earlier. For example, of the 10 participants who identified themselves as Kinesthetic learners, only 3 were truly so. Of the 86 Auditory- Kinesthetic or Visual-Kinesthetic learners, only 14 were truly Kinesthetic. Also from the 82 VAK, only 9 were Kinesthetic. Overall, 184 participants incorrectly identified their Learning Styles and preferences. Besides, of the 178 students who thought they were Kinesthetic, or a combination thereof, only 26 were true Kinesthetic; 68% were mistaken. Another explanation might be that when the students were asked about their hobbies, 147 students misinterpreted their hobbies such as, sports, swimming, basketball, football, dancing with their learning style. In other words, they had mistaken their favorite sports activity with the way of studying. Oral explanations, perhaps even a Question and Answer session before the questionnaire is administered, may alleviate these types of misunderstandings. To avoid similar misunderstandings Haar (2002), conducts interviews with teachers while probing their understanding of Learning Styles and preferences. Or, in the case of Fleming (1995) for his on-line questionnaire, he provides the option where students can get feedback and guidance about their learning preference via email. For the study present here, I personally explained to my students, in general terms, the strengths and weaknesses of each Learning Style, after I analyzed their questionnaire. Thus, based on my experience, I suggest that the questionnaires be accompanied by oral explanations for any future study.

Identification of one's Learning Styles is time-dependent. That is, our styles change over time. Fleming (1995) appropriately argues that as our styles are time-dependent, they are more guides rather than style. And as our style or guide changes, students are encouraged to take the questionnaire every so often. The aim here is knowing one's Learning Style as a tool to achieve more. The questionnaire and scale should be part of knowing oneself as a student; it is not a label rather an aid.

The Role of the Teacher

A precarious argument by Franzoni (2009) claims that the way the majority of teachers teach tend to benefit some students. This is because teachers traditionally mostly read and explain - an auditory tool- with very few visual aids such as maps, pictures, etc. Often, teachers do not even provide simple visual aids in the form of list of names and important points of a lecture. Providing a visual summary of a lecture or chapter is very helpful, especially in secondary classes. It provides the students with a starting point to learning and assimilating the material. Further, for those students who are Kinesthetic, verbal or visual presentations are not enough. These students prefer to solve problems on the board or role-play, yet these types of activities are not often pursued. The traditional teaching methods thus are not at all suited for the kinesthetic type students; they mainly serve the auditory students.

We examined the averages of those students who are Auditory, Visual and Kinesthetic, with the aim of finding an association between teaching style and student performance. From the group of 260 and for those students where a clear identification of Auditory, Visual or Kinesthetic style was made, **40** students were Auditory and their average was 72.0/100. **70** students were Visual and their average was 71.8/100, and **42** students were Kinesthetic and their average 70.0/100. And while the differences in these averages is within

a few points, still these are overall averages and we see a slight advantage Auditory and Visual students may have with the traditional teaching methods. In the future, a quantitative analysis could be performed to test for statistical significance between the different Learning Style groups. However, it is still worth the effort to include activities that enhance the learning experience of kinesthetic students, because at least one-third of the participants in our study had mixed Learning Styles. Thus, it is worth the effort to teach some subjects in a kinesthetic way, for example, with more experiments in sciences and hand-on approaches, allowing the students to come up with solutions to problems.

Kinesthetic students do best with hand-on approaches, as Hawk (2007) states, yet very few opportunities were provided to the **42** kinesthetic students who participated in the study. A simple yet effective teaching tool for kinesthetic type students is allowing them to solve problems on the board. Of the 42 kinesthetic students, 20 were not provided with the opportunity to solve a Math problem on the board. Of the 102 students with a combination style including kinesthetic, 52 students or (50%) were not solving problems on board. Our study revealed that 15 students from the group of 42 kinesthetic would like to have new concepts explained to them accompanied with exercises and projects for them to do.

Using kinesthetic means to explain or reinforce a concept should not be limited to only science classes. In social sciences like Civics or History or any language class, a teacher may introduce role plays or field trips to fire the imagination of the students. Some of these topics require memorization, for example, on the questionnaire we asked about Arabic History and Civics only, although other subjects such as Arabic Geography and Sociology fall in the same category. The majority of the students, 157 out of 260 (60%), considered it hard to memorize, but did so anyway. If a teacher would slightly change the method of delivery, for example show a movie, role play an event, hold a class debate, etc., students may remember more easily, as they are now participating in the subject matter. As one Civics

teacher does, he uses PowerPoint presentations in his lessons. Here, an enjoyable class experience influenced the students' perception of a topic.

Unfortunately, none of the teachers, engaged his/her History class in short role plays where the students can relive the events and interpret them from their point of view, thus internalizing the information instead of just learning by heart. We also found that classroom debates were held neither in Arabic History nor in Civics, two subjects that lend themselves to spirited and informative debates, forcing the students to critically think about the events. Instead, students were read the information and asked to learn and memorize it. A debate requires no special equipment, and further, prepares students to think on their feet, an important factor to achieve success, not only in academics, but in life in general. Thus, a teacher with small changes, can make a subject interesting and easy to learn, and more importantly, teach students life-skill that would remain with them beyond a particular class. Dunn (2009) decisively states that when teachers used the Learning Style strategies student achievement was higher. So one must wonder why these, and other teachers, are not using different learning styles when explaining a lesson. Dunn (2009) herself gives the answer: for teachers to successfully engage every student in a classroom based on the student's Learning Style preference, teachers should be informed, in depth, about the difference preferences. So the real question should be: Do teachers know about different learning styles? In order to answer this, another study must be conducted where the participants are teachers from different schools, public and private, teaching different subjects.

We presented results from our survey showing that 56% of the students consider Math to be easy (Graph 9), and that 60% of the students also want to have the opportunity to solve problems in class (Graph 10). The latter is strongly in line with the indication from the majority of students from each of the Learning Styles, V, A, K, VA, VK, AK, and VAK, choosing "solving problems" as the best way to learn Math (Graph 11). This indication is

irrespective of the low percent of students across the different Learning Styles who stated that they liked Math. The range here was 0 to 13% for AK and A, respectively. Yet, overall, 56% of the total group found Math easy irrespective if they liked the subject or not. Thus, it is feasible to have students succeed in a subject provided the correct tools and skills are used both by the teachers and the students.

For Arabic History, students identified their preferred learning method as "visualizing as a story". Thus a simple change would be to ask students to make presentations in various forms, including composing a story line. Again, not only would students learn the subject matter at hand, but obtain experiences in effective communications both oral and visual. In our study, we found that although 81 students mentioned that their teacher would ask them to give a presentation, 30 students clarified the query to indicate that presentations were done more than once a year, but not for the students in the 12th grade, as the teachers wanted this particular group of students to concentrate all their time on preparing for the governmental examinations. Clearly the teachers are under pressure to complete prescribed material, but, small changes that make the transmittal of information more effective is a worthy pursuit. Our study also found that the majority of the students are Visual or a combination thereof, with 70 Visual and 90 combinations, respectively. Further, 57 out of 260 students, or 36% stated that the visual aids were helpful to them in understanding a concept. When asked to what extent are visual aids used in the secondary classrooms, 71 students, or 27%, indicated that their teacher would sometimes use maps, sometimes even the same map as the textbook, in an Arabic History class. Thus, even small changes, using the maps provided by the textbook, appear to have a positive impact. Moreover, Dunn (1990) concluded that not all teachers teach according to the Learning Style approach. This may be due to a variety of reasons. Teachers don't bother with new research because they either don't understand it, or care to learn about it in the first place. For some, teaching it is just a job and not a vocation

where they shape future generations. Yet, another important factor may simply be the vast number of Learning Style models available. And while the presence of many models indicates the complexity of the subject matter, it may also act as a deterrent to teachers who feel overwhelmed, and with no clear and concise guidelines as to which model is best suited for a certain situation or how to apply a certain model to one's teaching. As a result, teachers usually feel frustrated and many give-up, Dunn (1990).

For whatever reason, the outcome is unfortunate, because once a teacher realizes the benefits of Learning Styles, and finds the appropriate model to use for her situation, she will then make the changes to her teaching in a manner that would benefit her students. Thus, the ideal survey would include another questionnaire addressed to teachers to probe their Learning Styles to ascertain if they know what Learning Styles are and if they are teaching in a way to accommodate various Leaning Styles.

Clearly, a teaching style that combines elements of different Learning Styles also breaks the monotony of lecture delivery, provides excitement and may induce more students to be enthusiastic about learning. That students are in school does not necessarily imply that they are enthusiastic; they may be there because they have to. If learning barriers are reduced and students perceive learning as fun, then both the teachers and the students will achieve more and be successful. And, some of these changes may be implemented with very little effort. On the part of the teachers, some effort is required in acquiring in-depth knowledge of Learning Style preferences, such that in addition to their knowledge in the subject matter that they are teaching, they can address the various learning preferences of their students. Teachers should know the strengths and weaknesses of each style and the teaching strategies best suited for each preference. As Hawk (2007) states, the teaching strategies should correspond to each learning style, like using textbook and notes charts for the students with predominantly visual preference, lectures and reading for the auditory students, etc.

Students and Study Habits

The results of our study indicated that some students have good study habits like the ability to organize their time effectively. Most students, 146 out of 260, are good at taking notes but not so good at taking a test. 190 had difficulty finishing a test on time and 230 claim they lose grades due to careless mistakes. This is something to be concerned about because test taking is more important than taking notes, as a Lebanese student's grade is mainly based on their test grades.

The way a student studies affects his/her performance outcome although according to Cooper (1969) not much has been done to see how study habits actually affect the academic standing of a student. In short, which habits are necessary and should be developed for academic success is not well researched. Furthermore, effective learning may not only depend on a person's study habits but also on other factors like personality, capability, environment, etc.

It appears that concentration is important because if students concentrate while studying not only would they learn quickly but they would also remember what they learned. In the group that we studied, 85% would prefer to study in a quiet place, although 53% stated that they get distracted very easily. Almost two-thirds of the group, 162 out of 260 or 62%, had difficulty concentrating. Both findings, "the inability to concentrate" and "easily get distracted", are significant but perhaps not unexpected. It takes practice to learn to concentrate and filter out distractions. So teachers and parents should try to help students learn how to master these skills. Distraction is an issue, exemplified by a comment on the questionnaire where the student learns more with her tutor, who interestingly does no more than explain the same problems as the teacher again, yet in a setting where the student is not easily distracted. It might be that some of these students have a slight predisposition to

Attention Deficit Hyperactivity Disorder (ADHD), and thus, in the future, the questionnaire that was used for this study should be accompanied by another scale testing the participants' disposition for ADHD. Assessing a student's disposition for ADHD is yet another piece of important information to both teachers and parents in their efforts to guide and train each student in the most effective manner to study and succeed.

We reported in Graphs 16, 17, 18 and 19, how various Learning Styles use different study skills, and we noted that Visual learners were using the specified study skills, Concentration, Organization, Listening and note taking, and Test taking, more than the other learning styles. For example, Visual learners used daydreaming as a Concentration skill, perhaps allowing them to distance themselves from their surrounding (achieve quiet place) and mentally visualize the study problem at hand. This is only a conjecture, and future studies may shed light on these and other features seen in this preliminary study.

Another possible explanation as to why Visual learners appear to use the different skills, the most may be influenced by the traditional teaching methods that are used which rely on pictures and figures, i.e. drawings, repetition, i.e. flashcards, and stressing important aspects of a subject, i.e. highlighting. Again, this may be answered in future studies.

Graph 18 clearly showed that students have difficulties in note-taking. They often tend to have the incorrect information in their notes, they find their notes difficult to understand, and they cannot distinguish important points. This is so in spite the fact that students do take notes and they check their notes to make sure they have not missed any points. Clearly there is a problem, especially as teachers have a tendency to test students about information from the class notes as well as the textbook. A simple yet effective solution may be to present a summary of the class explanation to the students beforehand, highlighting the important points that will be covered in class. The students then fill in the details. For

example, in a Math class, equations and figures may be provided beforehand, so that students do not spend time in class copying that known information. Rather, they then have time to listen, understand, and write notes as to why the equation was used, or how to use the same equation in various problems, etc. When the important points or a summary of the lesson is given to the students before class, some may even read about the topic from the textbook before coming to class, to further enhance their learning experience. And, with the teacher providing the important facts, the students worry less about incorrect notes, and hopefully they will understand their notes better. Teachers may hand out hard copies of the next lesson in class, or depending on availability, post it on the school website, or deliver the document via email. This will not impose on the teacher's time too much, as teachers do have lesson plans prepared. This idea is not limited to Math classes.

In our study, when students had to listen or take notes in class 16% of the students -14 Auditory plus 29 combinations- would rather listen and not take notes, which is consistent with their Learning Style. If we inspect Graph 11 which indicates how students study Math, VA and AK learners do not listen to the teacher in class. 69 students or 26% would record everything, and 90 or 34% would check their notes to see if they need to add something or if they had forgotten anything. These points were clearly seen in the results of graph 18. Our results differ from those of Cooper's (1996) findings where only 51% of the participants would study the material given to them. From our study we see that our students are doing better in the sense that they do want to make their notes complete before they eventually study.

On the other hand, there are similarities between the two studies. In Cooper's (1996) study, they found out that 91% of the participants had spelling errors, and 88% had trouble with sentence structure, two factors that influence their written test assignments and performance assessments. In our findings, 230 or 88% admitted to careless mistakes during a

test. This is an important point that teachers and students should address, that is, are students losing grades -clearly not an action that is beneficial to their success? Is it because the students are anxious- they suffer from test anxiety- or because they have poor study skills, e.g. lack of concentration? 212 students or 81% claimed that they have difficulty in choosing the main points of a lesson. This point should be future explored, as providing a summary of a lesson takes little effort.

Effective time management was also an issue for the participants of both studies. From the results of Cooper's (1996) study, 66% could manage their time and study effectively, but the participants of our study, 70% (or 183) couldn't find time for their social activities if they studied. Of the latter group 62% (162) said they don't have enough time to study. It is worthwhile to point out that the participants of the study were college students, on average a few years older than our group of students, and moreover these students were majoring in their choice classes while secondary students are teenagers studying subjects that are imposed on them.

In our study, we noticed that female students were using the four mentioned study habits more than the male students, (see Graph 20). Nevertheless, any student, male or female, can learn these study skills (concentration, organization, listening-taking notes, and test taking) and improve their academic standard. Indeed, teachers and parents should invest time in teaching their students and children study skills; the benefits are worth it.

This combined data show how most students study: through a mixture of styles and skills. And indeed, it is often hard to state that one is only using auditory sense in the classroom in exclusion of any visual input, unless the student happens to be visually impaired. Thus, our results and conclusions provide trends, more than absolute findings. As examples, we note that a 12th grade female student, who identified herself as Kinesthetic,

actually used all the skills enumerated. On the other hand, 8 of the participants did not note any utilization of the enumerated skills. These students were not totally failing in their classes, so they must be learning and performing on their tests through some other mechanism, perhaps not clearly identified on the questionnaire, or clearly identified by them as a skill they use.

The inability of some students to correctly identify or to identify at all their study habits may also be reflected in the following unexpected result. The average of the 39 students who correctly identified their style was 70.28/100, while the average of those students who were totally incorrect in identifying their style- 37 students- was also 70.28/100. We note that the average grades reported comprise multiple subjects, ranging from Math to Science to History and Civics. So while the averages are close, the grades for different type of classes, Math versus Civics, two subjects for which the survey asked for grades, are different. Further studies should ask the grades of all the classes the participants take, and monitor the participants' performances in high school, grades 10, 11 and 12, to probe the correlation of grades and retention of subject matter and more importantly the ability of the students to apply information acquired in e.g. geometry class in 10^{th} to an analytical geometry studied in 12^{th} grade. In closing, we again stress that the aim of this study is to find trends between learning styles, study habits and mode of instruction.

CONCLUSION

Learning styles are a student's tool to learn more, recall more and, in due time, achieve more academically and in life in general. No matter what the critics say or how they try to deny that learning style may help a student, the research and supporting evidence suggests otherwise. Even if it only helps a student to be more **self-confident**, **achieve more** and **tolerate others more,** Hendry (2005), stated that it is worth every teacher's time to first understand what learning styles are and then introduce them to students and parents. It would also be encouraging to get the parents involved and explain to them how they can help their child to study according to his/her learning style, develop his/her strengths, and succeed. In short, every child can learn, and this approach is both pragmatic and encouraging, especially to students who are at risk (Dunn, 2009). There is a method one can apply to improve one's learning and studying skill to achieve more, in academics and in life.

An interesting quotation by Lovelace states "…physicians opted to prescribe aspirin to prevent heart attacks on the basis of a randomized, double-blind experiment that achieved an average effect size of only r =.034; therefore, educators should implement learning style based instruction since it average effect sizes ten times greater than those of the aspirin experiment." (as cited in Dunn, 2009, p. 138).

Franzoni (2009) claims that often teachers and educational systems ignore to take into account individual differences that exist between learners, such as the learners' ability, background knowledge, learning goals and learning style. He refers to this neglect to be the reason why teachers are not using learning styles in their preparations of teaching. Again, this obstacle is not insurmountable.

This preliminary study was qualitative in nature but paved the way for future quantitative studies. Quantitative studies would clarify and determine where there are

correlations between a student's learning style and academic achievement, and what is the nature of the correlation, specifically for Lebanese students. Another future study may investigate the teaching approaches of foreign teachers teaching in Lebanon, and how their approaches and integration of students learning styles into their teachings are different than those of Lebanese teachers. Studying the issues from the teacher's point of view would be enlightening. Our study looked at the issue from a student's point of view. Pitts (2009) articulates that when a teacher has knowledge about different learning styles, she then can teach more effectively to her students. Her students would perceive and appreciate that their teacher cares about them and about their academic success.

One of the criticisms involved the difficulty in quantifying learning. Indeed this is a very hard, almost impossible variable to quantify, as it is heavily influenced by a person's characteristics. Nevertheless, one measure of learning that is quantifiable is conducting a study over several years with the same group of students and investigating how concepts learned evolve. For example, how concepts learned in Math class in 10^{th} grade, are carried over into 11^{th} and 12^{th} grade; and more importantly, how are students transferring concepts in Math to say a problem in Physics or Chemistry. By following these types of studies, we can ascertain the efficacy of the Math instruction and the learning experience of the student. In turn, studies of this kind would enable high school teachers in Lebanon to better tailor the curriculum to enhance the learning experiences of the students, and produce learned and successful members of society.

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APPENDIX A

Please fill in the following demographic information

Grade: ---------- **Age: ----------**

Gender: ---------- **General Average: ----------**

Hobbies: ----------

The **VAK** (Visual Auditory Kinesthetic) learning styles model suggests that most people can be divided into one of three preferred styles of learning. These three styles are as follows.

- Someone with a **Visual** learning style has a preference for seen or observed things, including pictures, diagrams, demonstrations, displays, handouts, films, flip-chart, etc. These people will use phrases such as 'show me', 'let's have a look at that' and will be best able to perform a new task after reading the instructions or watching someone else do it first. These are the people who will work from lists and written directions and instructions.

- Someone with an **Auditory** learning style has a preference for the transfer of information through listening: to the spoken word, of self or others, of sounds and noises. These people will use phrases such as 'tell me', 'let's talk it over' and will be best able to perform a new task after listening to instructions from an expert. These are the people who are happy being given spoken instructions over the telephone, and can remember all the words to songs that they hear!

- Someone with a **Kinesthetic** learning style has a preference for physical experience - touching, feeling, holding, doing, and practical hands-on experiences. These people will use phrases such as *'let me try'*, *'how do you feel?'* and will be best able to perform a new task by going ahead and trying it out, learning as they go. These are the people who like to experiment, hands-on, and never look at the instructions first!

There is no right or wrong learning style.

1. **From these preferred learning styles, which one do you think you are?**
   Please choose one option only.

_____ **Visual** _____ **Visual and Auditory**

_____ **Auditory** _____ **Auditory and Kinesthetic**

_____ **Kinesthetic** _____ **Visual and Kinesthetic**

_____ **Visual and Auditory and Kinesthetic**

Please answer the following statements with YES or No

		YES	NO
2	**I focus entirely on my work when I study**		
3	**Before I begin an assignment, I estimate how long it will take me and then try to beat the clock**		
4	**I have difficulty concentrating when I study**		
5	**I usually seek a quiet place to study**		
6	**I can't sit and study for long periods of time without becoming tired or distracted.**		
7	**I go to class, but I usually doodle, daydream, or fall asleep.**		
8	**I take time to study every day**		
9	**I know what time of the day I do my best work**		
10	**I often have trouble finding enough time to study**		
11	**I spend too much time on some subjects and not enough on others**		
12	**I usually spend hours cramming the night before an exam.**		
13	**When I study enough, I don't have time for a social life.**		
14	**I have difficulty determining important points in a lesson**		
15	**I check my notes to fill in any missed words soon after the lesson**		
16	**I try to record everything a teacher says in class**		
17	**I listen carefully to the teacher but I do not take notes**		
18	**My class notes are sometimes difficult to understand later.**		
19	**I usually seem to get the wrong material into my class notes.**		
20	**I have trouble finishing tests on time**		
21	**I usually lose points on my exams because of careless mistakes**		
22	**Before starting a test, I plan how much time to use on each section of the test**		

		YES	NO
23	**If I have any time left, I check over my test to avoid errors**		
24	**I study enough for my test, but when I get there my mind goes blank.**		
25	**I often study in a haphazard, disorganized way under the threat of the next test.**		
26	***I enjoy lessons when we talk about our work and have discussions with partners or in groups.***		
27	***I learn things best when I have to get up and do it for myself.***		
28	***I find it easy to remember things that other people have told me.***		
29	***I am good at remembering people's faces, even if I haven't seen them for a while.***		
30	***I am good at making things.***		
31	***I find it easy to remember stories that have been read to me.***		
32	***I find it easy to learn new things when they are shown in different colored writing and with pictures***		
33	***I find it easy to remember the words to music***		
34	***I like to change what I am doing quite often and have little breaks in between.***		
35	***When I am trying to spell a word, I find it easy to split the word into different sounds to help me spell it.***		
36	***when I am trying to remember something like a phone number, I sometimes make up a rhyme or tune to help me remember***		
37	***When I am learning to spell a word, I look closely at the word and try to remember what it looks like in my head.***		
38	***when I am trying to tell someone what I do, I like to show them by using my hands or body to explain***		
39	***I like looking really closely at things and often see things other people have missed.***		
40	***I remember to spell words by thinking about the pattern made by my hand when writing the letters.***		
41	***I easily remember information when I see it on a video program or on the overhead projector.***		
42	***I find it difficult to sit still for a long time and sometimes fidget.***		
43	***I can understand things clearly when they are shown in graphs.***		

		YES	NO
44	**Do you study with a friend, explain to each other and ask questions?**		
45	**Do you move around as you study?**		
46	**Do you draw pictures and diagrams to help you in studying?**		
47	**Do you understand it better if someone reads the chapter to you?**		
48	**Do you have a squish ball in your hand to stop you getting side-tracking?**		
49	**Do you use flash cards to make it easy for you to remember important points?**		
50	**Do you try to make up rhymes or a song to remember key points or a list?**		
51	**Do you use coloring pens/ highlight to make it easy for you to remember important points?**		

Please answer the following questions.

52. Do you have a tutor (or a friend or a family member) who explains things *differently* than your teacher-to help you in understanding the lesson? ----------

If yes, for which subjects? ----------

How does s/he explain things differently?

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53. What type of homework do you like best (circle from the list) (Preparing Power point presentation- giving an oral presentation- writing essay- experiments-)

WHY? ----------

54. How would you prefer your teacher to explain a new concept (lectures —discussion —visuals/pictures— questions/answers—dialogue— with lots of exercise to do—doing project)? ----------

WHY ----------

55. Is it easy for you to study Math? ----------

Why? ----------

How do you study Math? ----------

What is your Math average? ----------

56. When explaining Math, does the teacher only explain or use different methods?

Does the teacher allow students to solve problems on the board?

Do you understand your teacher's explanation or would you prefer the teacher to -------

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57. Is it easy for you to study Arabic History? ----------

Why? ----------

How do you study Arabic History? ----------

What is your Arabic History average? ----------

58. When explaining Arabic History does the teacher only explain?

Does the teacher demand you to study Arabic History by heart?

Is it easy for you to study by heart? ----------

Does the teacher use maps in explaining Arabic History lessons?

Does the teacher ever use role play/drama to explain an event in History?

Do you understand your teacher's explanation or would you prefer the teacher to

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59. Is it easy for you to study Civics? ----------

Why? ----------

Do you have a 'secret' way to study Civics?

What is your Civics average? ----------

60. When explaining Civics does your teacher encourage class discussions?

Does the teacher ask you to make list/posters about the main points in the lesson?

Do you understand the concepts or study by heart for your Civics tests?

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61. Is it easy for you to study English? ----------

Why? ----------

What's your English average ----------

62. In English class, does the teacher ask you to do oral presentation?

Do you enjoy doing oral presentation? ----------

Does the teacher ask you to perform short role-plays? ----------

Do you enjoy it? ----------

Does the teacher demand you to prepare posters related to the English lesson?

If so do you enjoy doing preparing posters related to the English lesson?

WHY? ----------

63. Did you enjoy filling out this questionnaire?

WHY ----------

Thank you for your time