

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

**PERCEPTUAL LEARNING STYLES: AN INVESTIGATIVE
STUDY ON FIRST YEAR STUDENTS AT A. A. U.**

BY

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: AN INVESTIGATIVE STUDY ON FRESHMAN STUDENTS AT A. A. U.

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A thesis submitted to the School of Graduate Studies of Addis Ababa University in partial fulfillment of the requirements for the Degree of Master of Art in Teaching English as a Foreign Language. (TEFL)

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ABSTRACT

Perceptual learning style preferences are gaining importance of late (Reid 1987, 1995). The instructional implications of learning styles are far reaching (Ehrman, 1996). This study aimed at investigating the perceptual learning style preferences favored by freshman students at Addis Ababa University. Accordingly, two different types of questionnaires – one developed by Reid (1987) and the other by Diaz Maggioli (1996) – were distributed to and collected from 390 students. There were 215 students from the social science stream: 115 males and 100 females; and 175 students from the natural science stream: 105 males and 70 females. Interview questions were adapted from Ehrman and Christensen (1994), and the results were used as crutches to support the scores obtained from the questionnaires.

It was found that the majority of the students from both streams showed strong preferences toward visual, kinesthetic, and individual learning styles. In addition, tactile and auditory learning styles were considered only as minor preferences by the majority of the students from both streams. Moreover, most of the students from both streams showed a negative learning preference toward group learning. Finally, the female students in both streams were found to be significantly more inclined toward the auditory and group learning styles than their male counterparts. On the other hand, the male students in both streams were found to be significantly more inclined toward kinesthetic, tactile, and individual learning than their female counterparts. Based on these findings instructional implications were drawn and recommendations forwarded.

CHAPTER ONE

INTRODUCTION

This introductory chapter discusses the statement of the problem that is, what the study aims to investigate. Next, the objectives of the study are discussed where the specific questions that the study aims to answer are listed down. Third, the significance of the study is discussed where attempts are made to show why the study is important. Finally, the limitations of the study are discussed where the scope and limitations of the study are described.

1.1. Statement of the Problem

Over the past decades, teaching English as a second or foreign language (ESL/EFL) has changed a lot. Curricula, teaching methods, and teaching materials have been developed in accordance to the changing needs of learners. However, there are still curricula of many ESL/EFL programs that are still linear or systematic, making it very difficult to cater for individual differences (Kang, 1999).

Research on learning styles, on the other hand, has given teachers insights on different views of learning and shown them how to use these insights in the classroom. When teachers become aware of the individual differences of students, they become better equipped to match teaching and learning styles so that learning can be maximized.

According to Reid (1995), learning styles are internal characteristics of individuals that help in the intake or understanding of new information. All learners do not learn the same way. They have individual attributes to the learning process. Some prefer the spoken language; others may rely heavily on materials presented visually; still others may respond better to tactile activities. Reiff (1992) points out that students learn differently and at different paces due to their biological and psychological differences. Naturally, these differences abound in any ESL/EFL contexts where students' cultural and educational backgrounds are different.

Whatever kind of learners we are, we all possess a learning style that is a "biologically and developmentally imposed set of personal characteristics that make the same teaching method effective for some and ineffective for others" (Dunn, Beaudry, and Klavas, 1989:50). Research studies show that where there is compatibility between instruction and learning style preferences students learn more, better and may retain that learning longer (Hickson et al., 1994).

In language teaching, research into learning style preferences has gained importance in recent years (Pearson, 1988; Reiss, 1985; Rubin, 1975; Rubin and Thomson, 1994; Wenden, 1986, 1991). The implication of these research findings to language teaching especially in the area of methodology may be far reaching given the fact that gearing instruction to accommodate learning style preferences "can result in improved learner satisfaction and attainment" (Willing, 1988:1).

Different researchers categorize learning styles in different ways. For instance, Dunn, Dunn and Price (1986) classify learning styles into 22 different elements. Ehrman (1996), on the other hand, classifies them into two categories: a) sensory channel modalities (auditory

kinesthetic, visual, tactile); b) sequential – random; c) concrete – abstract; d) deductive – inductive; e) left – right hemisphere f) field independent – field dependent, and g) field sensitivity – field insensitivity.

That perceptual learning styles (or sensory channel modalities) are important and that they have a profound effect upon second or foreign language learning (ESL/EFL) can be seen from the amount of research being done on them (Reid, 1987, 1995; Sims and Sims, 1995; O'Brien, 1990; Ehrman and Christensen, 1994). There doesn't, however, seem to exist much research on the area (learning styles) and none on perceptual learning style preferences in our context. Therefore, it appears essential that a study into perceptual learning style preferences and their instructional implications in our context be made. Thus I want to investigate the following problem: What are the perceptual learning style preferences favored by freshman students at Addis Ababa University and what are their implications for instruction? I that this will go some way toward filling the existing gap in the area.

1.2. Objectives of the Study

This study intends to find out what perceptual learning preferences are favored by the students and what instructional implications these preferences have. I will particularly be interested to investigate the following questions:

1. What is (are) the preferred perceptual learning style(s) of freshman students in the social science stream?
2. What is (are) the preferred perceptual learning style(s) of freshman students in the natural science stream?

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1. What is (are) the preferred perceptual learning style(s) of freshman students in the social science stream?
2. What is (are) the preferred perceptual learning style(s) of freshman students in the natural science stream?

3. Is there any difference between males and females in the choice of preferred perceptual learning style(s)?

1.3. Importance of the Study

Perceptual learning style preferences are some of the factors that have to be reckoned with if propitious second/foreign language classroom conditions are to be provided to the learners. Research into learners of English as a second language in the United States and Canada has come up with some revealing findings about the importance of learning styles (Ballinger and Ballinger, 1982; Birchbichler and Omaggio, 1978; Genesee and Hamayan, 1980; Hansen and Stransfield, 1981, 1982; Hosenfeld, 1979; Ramirez, 1986; Wong Fillmore, 1976).

Perceptual learning style preferences have been given due importance because of their far reaching implications for curriculum designers, materials developers, students and teachers alike (Reid, 1987). Many materials developers may not take learning styles into consideration when preparing teaching materials. Thus a knowledge of learning style preferences may help them design a variety of activities that may help cater for individual differences.

I also hope that assessment of students' perceptual learning style preferences may help instructors avoid "style-wars" with their students.

Finally, I hope that the study could be used as a springboard for further research in the area. It is only natural that research works be replicated to gain a thorough insight about learning styles in different cultural contexts. To this end, it may be interesting to note that Reid's

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(1987) work has been partially replicated by Call (1995), Hyland (1994), Stebbins (1995) and Su (1995). More research works into the area using similar procedures and tools may help us “begin to improve our database of learning style profiles” (Oxford and Anderson, 1995).

1.4. Limitations of the Study

The study aims at investigating the perceptual learning style preference favored by freshman students at Addis Ababa University enrolled in the year 2000/01 in the social science and natural science streams.

I believe that students’ learning style preferences should be investigated in other universities and colleges as well. However, I chose to base my study on students at the aforementioned university only because of financial and time constraints. But it is my belief that the results of the study could possibly apply to students in other institutions of higher learning as well.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter discusses what the literature says with regard to learning styles in general and perceptual learning styles in particular. After a discussion of indications of learning styles, this chapter goes on to define learning styles and perceptual learning styles. It then describes the learning style categories proposed by various researchers into the area. Next, it discusses variability of style and how style can be flexed. Finally, a discussion on the application of a knowledge of learning styles follows. That is, this chapter rounds up discussing what happens when there is a match or mismatch between students' learning style preferences and instructors' teaching styles.

2.1. Indications of Learning Style

Learning styles are broad preferences of one sort or the other that learners apply in their learning processes. They are general characteristics which are realized through the application of specific learning strategies (Ehrman, 1996). In most instances, students' learning preferences are worked out from either a description or observation of strategies they use in their process of learning.

The teacher will be constantly making hypotheses (and continually testing them) about his students' learning styles by observing what goes on in the classroom as well as by asking his students to describe strategies they use while transacting their business of learning. For instance, Ehrman (1996: 47-49) provides us with examples of such descriptions and

hypotheses. Accordingly, the following excerpts are about two such students, John and Sandy. John was observed to act this way (Ehrman, 1996: 47):

When the curriculum follows the textbook closely, John works steadily and systematically. He readily performs the drills and exercises that fill the text. When asked to participate in more free-form activities such as storytelling or roleplays, John grumbles and stumbles.

Ehrman (1996: 49) hypothesizes that John prefers to learn items discretely and in an ordered manner. She further suggests that John might feel uncomfortable if asked to work in situations that call for spontaneity. Thus, it may be concluded that John will prefer to work in “a program with a clear and detailed syllabus and that sticks quite closely to lesson plans that build up control of each piece of language in an orderly way” (Ibid.).

Similarly, Ehrman (1996: 48) states the following observation about student Sandy:

The times when I try to explain something, she frowns, kicks her feet around, and says that if she wants an explanation, she will ask for one. I keep urging her to listen to the tapes, but she doesn't do it.

From such observation about Sandy, Ehrman (1996: 49) hypothesizes that she may be inclined to learn kinesthetically. Ehrman further suggests that the student likes to learn “by moving around and using her hands” (Ibid.).

The following excerpt may also shed some more light to observation of learning styles in action. It is taken from an interview with student Kelly about her learning style (Ehrman, 1996: 48):

Kelly *I have tried to use the tapes for diction practice. This didn't work very well, so now I review words, which I read aloud, and then I listen to the tapes. I repeat after the tape and try to pick up the general meaning of what I hear. On the second listening, I practice pronunciation. I go through slowly to connect the sound and written form and meaning. It's like doing grammar drills – I look at the pattern then the meaning.*

Interviewer *So you like to get control of the form, then think about what it means.*

Kelly *Yes, most of the time. I really like studying reading-the foreign alphabet is really interesting to learn. What's really hard is comprehension in class, especially if I haven't seen it in writing or on the blackboard. I just get lost. It goes too fast, and I can't keep up with it.*

Interviewer *You can manage the reading and enjoy it, but in-class comprehension just gets out of control.*

Kelly *Yes, I just never know what to expect in class when I have to listen.*

Ehrman (1996: 49) suggests that Kelly's case is probably similar to that of John's discussed above in that both think that tight control of some sort is very important in the learning process. She further elaborates how Kelly's interview fragment sheds light to how hypothesis testing can work. To start off the interviewer thought that Kelly might have a low

preference for auditory learning style. However, as the interview progressed, this hypothesis seemed on weaker grounds than the one about Kelly's "need for firm mastery and tight control of target language material, and this is where the exploration was beginning to go in the interview" (Ibid.).

2.2. What is Meant by Learning Styles?

One of the issues in language learning that seems to have caught the attention of many researchers is learning style (Oxford, 1994). Learning styles have been defined differently by different researchers. Cornett (1983: 9) defines learning styles as "overall patterns that give general direction to learning behavior". In a related definition, Dunn and Griggs (1988: 3) state that "learning style is the biologically and developmentally imposed set of characteristics that make the same teaching method wonderful for some and terrible for others." Keefe's (1979:4) definition is not very much different where he defines learning styles as being "cognitive, affective, and psychological traits that are relatively stable indicators of how learners perceive, interact with, and respond to the learning environment."

Thus, it may be said that the definitions talk about preference in some way or the other. Parrott (1993: 40) states that a student's inclination to prefer certain ways of learning may be taken as his styles. He further states that a learning style is "used to describe broad, general characteristics of approach to learning, and it is likely that the preferred learning styles of any one learner will be manifest in all aspects of learning, not just in relation to learning foreign languages." (Ibid.) Relatedly, Skehan (1991: 228) states that a learning style is "a general predisposition, voluntary or not, toward processing information in a particular way." Thus, it

may be said that the knowledge of such styles can help lead to the construction of a “unified theory of second language acquisition” (Brown, 1994: 105).

Some other researchers relate learning styles and learning strategies. Accordingly, learning styles are exhibited through learning strategies which are specific behaviors used by learners (usually intentionally) to increase their understanding of the foreign or second language information. To this end, Oxford (1994: 140) states that strategies include “note taking, seeking conversation partners and using gestures to convey meaning when words are not known.”

On the other hand, Brown (1994: 104) states that there has been a lot of confusion in the use of such related terms as process, style, and strategy. He forwards a definition of these terms (Ibid.):

Process is the most general of the three concepts. All human beings engage in certain universal processes.... We universally use principles of transfer in the process of learning and retention...

Style is a term that refers to consistent and rather enduring tendencies or preferences within an individual. Styles are those general characteristics of intellectual functioning (and personality type, as well) that especially pertain to you as an individual, that differentiate you from someone else....

Strategies are specific methods of approaching a problem or task, modes of operation for achieving a particular end, planned designs for controlling and manipulating certain information....

To sum up, it may be said that the various definitions seem to converge toward learning preference, experience and approach. One such general definition is provided by Chastain (1988: 164) where he defines learning styles as “the particular approach individuals have to learning.” He further suggests that how students react to life experiences, how they approach learning, and how they tackle their academic may affect their choice of learning styles (Ibid.). He elaborates his point even further by citing Eison and Pollio (1985) who state that “students’ learning styles differ depending upon their personality traits, locus of control, study habits and attitudes, test anxiety, and personal orientation toward grades and learning” (Chastain, 1988: 164).

2.3. Learning Style Categories

There are many different ways in which learning styles may be identified and grouped (Entwistle, 1988). For instance, Oxford and Lavine (1992: 38) state that language learning styles are “the general approaches – for example, global or analytic, auditory or visual – that students use in acquiring a new language.” Others group learning styles in terms of different but interrelated aspects (Willing, 1988; Wallace and Oxford, 1992). To this end, Oxford and Anderson (1995: 203) opt for six such interrelated aspects that make up learning styles instead of the conventional four aspects:

1. *Cognitive elements include preferred or habitual patterns of mental functioning (often called ‘cognitive styles’).*

2. *The executive aspect deals with the degree to which the person seeks order, organization, and closure; and manages his or her own learning processes.*
3. *The affective aspect reflects clusters of attitudes, beliefs and values that influence what an individual will pay most attention to in a learning situation.*
4. *The social contribution concerns the preferred extent of involvement with other people while learning.*
5. *The physiological element involves at least partly anatomically based sensory and perceptual tendencies of the person.*
6. *From the stand point of behavior, learning style relates to a tendency to actively seek situations compatible with one's own learning preferences.*

Different researchers put the number of learning styles differently. For instance, Ehrman and Oxford (1990) have come up with 20 style dimensions. Out of these, Oxford and Anderson (1995: 204) mention the following as being important (they have put the primary style component next to these dimensions):

- ☞ *Global and analytic (cognitive)*
- ☞ *Field dependent and field independent (cognitive)*
- ☞ *Feeling and thinking (both affective and cognitive)*
- ☞ *Impulsive and reflective (both affective and cognitive)*
- ☞ *Intuitive – random and concrete – sequential (both cognitive and executive)*
- ☞ *Closure – oriented and open (both cognitive and executive)*
- ☞ *Extroverted and introverted (both social and affective); and*
- ☞ *Visual, auditory and hands-on (physiological)*

According to Brown (1994) learning styles incorporate physical, affective, and cognitive domains. This categorization is not very far from the one we saw earlier. However, contrary to some researchers' views, Brown (1994: 105) contends that learning styles are not "stable traits in adults" rather "differing contexts will evoke differing styles in one individual."

It should also be noted that learning styles and culture are strongly linked. As Hofstede (1986: 305) states "our cognitive development is determined by the demands of the environment in which we grew up: a person will be good at doing the things that are important to him/her and that(s)he has occasion to do often." Similarly, Papert (1987) argues that learning style can be taken as a "contextual variable since what the students bring to the classroom is as important as the experience itself."

A learning style is multidimensional (Kinsella, 1996). To this end Reiff (1992) classifies learning styles into five stimulus categories: environmental elements (sound, light, temperatures, design), emotional elements (motivation, persistence, responsibility), physical elements (perception, intake, time, mobility), sociological elements (self, partner, team, mentor, varied), and psychological elements (global, analytical, impulsive, reflective). Thus, it may be said that cognitive and physiological domains are included in learning styles (Oxford, Hollaway and Horton – Murillo, 1992).

2.4. Perceptual Learning Styles

Perceptual learning styles (also known as sensory channel modalities) are probably some of the most known and most important learning styles (Reid, 1987). It is assumed that learners

receive information through their senses and choose some senses over others (O'Brien, 1989; Oxford and Ehrman, 1993; Kroonenberg, 1995).

Most students, especially adults, will often speak of their perceptual preferences by way of discussing whether they choose to see things written on the board, listen to it as the teacher discusses about it, listen to tapes, or participate in role playing and so on. When they state such preferences they usually mean that they choose to have either "visual support such as writing on the board, hand outs or textbook material when they hear unfamiliar language, or they prefer to hear what they read" (Ehrman, 1996: 59).

Perceptual learning styles were first reported by Dunn and Dunn (1979) and later by Dunn (1983). Reid (1987: 89) cites Dunn (1983, 1984) and Reinert (1976) in listing the four basic perceptual learning channels or modalities:

1. *Visual learning: reading, studying charts.*
2. *Auditory learning: listening to lectures, audiotapes.*
3. *Kinesthetic learning: experiential learning, that is, total physical involvement with a learning situation.*
4. *Tactile learning: "hands-on" learning, such as building models or doing laboratory experiments.*

In addition to these four basic perceptual learning styles forwarded by Dunn (1983, 1984), Reid (1987) has also included group and individual learning styles to be part of the list.

2.5. Variability of Style

Very few learners operate on only one style during their lives. Most of them shuttle back and forth from one style to the other though they may have one dominant learning style. Thus, to use Ehrman's (1996: 51) words, though "most learning style models are bipolar..., they really represent a continuum of behavior." Accordingly, it may be suggested that learning styles and situations interact. To this end, Ehrman (1996: 53) states that "[situations] also have considerable influence on choice of learning strategies associated with one learning style or another."

Some learners are very flexible in their use of learning styles. For such students learning styles are just "comfort zones" that is, something comfortable to work with but not to stick to feverishly (Ehrman, 1996). Other learners, however, are very rigid when it comes to choosing a learning style preference. In such instances the learning program will not be effective. The students will blame the program for not succeeding while the program will label these students as failures (Ibid.).

Therefore, learners may be classified anywhere from mild users to rigid followers of a learning style preference. Ehrman (1996: 54) agrees to this when she states the following:

A learning style, then, can run the range from a mild preference ("I'd rather learn by discovering patterns for myself") through a strong need ("It interferes with my learning when I haven't mastered the grammar patterns first – I have trouble following the material that uses them.") to an out-and-out rigidity ("I have to see it before I can remember it; if I don't see it, nothing sticks at all").

2.6. Application: Learning Style Matches and Mismatches

Many learning difficulties may be attributed to learning style mismatches (Ehrman, 1996). Scarcella and Oxford (1992) suggest that learners differ according to their learning preferences. Thus, when the student's learning style preferences and the instructors' teaching styles are not matched, "style-wars" may result (Oxford et al. 1993). This conflict between styles might hamper the effectiveness of the foreign / second language program (Ehrman, 1996). To this end, Ehrman (1996: 50) reiterates that "when there is a mismatch between the learner's style ... and the curriculum and teaching style of course, there will be effects on the efficiency and effectiveness of the learning." Relatedly, Fuchs et al. (1986) concluded from their study that the performances of high-and-low-achievers were different under different teaching styles.

Students stand to benefit when there is a match between learning and teaching styles. For instance, Domino (1979) found that college students that were taught in their preferred styles scored higher on tests, factual knowledge, attitude and efficiency than their less fortunate counterparts whose preferences were not matched by teaching styles. Similar results have also been reported by many other researchers into post-secondary education of English and other subjects (Grasha, 1984; Pettigrew and Zakrajsek, 1984; Sapp, Elliot, and Bounds, 1983; Schemeck and Grove, 1979). Not surprisingly it has also been suggested that situation – specific anxiety level may decrease when learning styles and teaching styles are matched (Lenehan et al., 1994).

In fact, Spolsky (1989: 110) summarizes the condition as follows:

Learning style preference condition (typical, graded): Learners vary (both individually and according to such characteristics as age, level, and cultural origin) in their preference for learning style (visual, auditory, kinesthetic, and tactile) and mode (group or individual); as a result, learning is best when the learning opportunity matches the learner's preference.

Therefore, it would be to everyone's interest if teaching and curriculum could be adapted to suit the learning style preferences of learners since "people of every learning style can learn and learn well" (Ehrman, 1996: 55).

This adaptation, however, need not be a major undertaking. More often than not even the slightest change in activities letting students know you've recognized their needs might do wonders in the long run. Ehrman (1996: 129) reiterates this point when she states the following:

The best approach is to gradually build in an increased array of options for classroom work and homework assignments. Guidance to students in structuring their homework along lines that begin in their comfort zones and gradually stretch them out of the comfort zones is generally well received.

Teachers often complain of the near-impossibility of providing task-based activities to students in large classes by way of answering the question of adaptation to students' learning style preferences. This complaint, however, arises because the teachers expect too much

from themselves than the task itself. As Ehrman (1996: 130) states “[the teachers] are the only ones who are expecting the miracle of meeting everyone’s needs at once.”

To sum up, it can be said that learning styles research has greatly helped improve the teaching-learning process by “increasing our awareness of the need to take individual learners variations into consideration and to diversify classroom activities in order to reach a wider variety of learners” (Arnold, 1999: 17). It can also be said that this knowledge about learning styles has underscored the fact that every individual can learn a language well enough provided that his preferences are matched.

When students become aware of their learning style preferences it may help them toward achieving style flexibility; that is, it may help them to adapt to different styles as well as their dominant one(s). In short, raising students’ awareness to their learning style preferences may result in “higher interest and motivation in the learning process, increased student responsibility from their own learning, and greater classroom community” (Reid, 1999: 300).

Finally, the following excerpt taken from Reid (1999: 302) might help summarize the whole idea about learning styles:

- ☞ *Every person, student and teacher alike, has a learning style and learning strengths and weaknesses;*
- ☞ *Learning styles exist on wide continuums, although they are often described as opposites;*

- ☞ *Learning styles are value neutral; that is, no one style is better than others (although clearly students will be affected by their school systems, most of which value some learning styles over others);*
- ☞ *Students can be encouraged to “stretch” their learning styles so that they will be more empowered in a variety of learning situations; and*
- ☞ *Often, students’ strategies can be linked to their learning styles.*

CHAPTER THREE

METHODS AND RESULTS OF STUDY

This chapter discusses the methods and results of the study. In the first part, the tools that were used to collect data and the reasons for choosing them is discussed. In the second part the analyses and interpretations of the data are discussed.

3.1. Methods of the Study

The study focused on discovering the perceptual learning styles favored by a sample of first year students from the social science stream and the natural science stream enrolled in the academic year 2000/01 at Addis Ababa University.

There are several questionnaires used in the assessment of perceptual learning styles or sensory channel preference. The oldest (and perhaps the classic) such instrument is the Edmonds Learning Style Identification Exercise or ELSIE developed by Reinert (1976). This instrument has four dimensions: "Visual image of an object of activity, visual image of a word spelled out, sound of a word, or kinesthetic reaction" (Ehrman, 1996: 62). However, this instrument is frowned upon by current researchers into the area. For instance, Corbett and Smith (1984: 220) cite research findings to caution against the use of the instrument and suggest that "as a group descriptive ELSIE is of questionable value in matching approach and students in harmonious learning."

Other such instruments include the Learning Channel Preference Checklist (O'Brien, 1990), the Perceptual Learning Style Preference Questionnaire (Reid, 1987), and the Learning Line Questionnaire (Diaz Magioli, 1996). Any of these self-report questionnaires may be used to assess sensory modalities since their validity has been proven by the respective researchers.

Using more than one of these standard questionnaires can help provide a better picture (Oxford et al., 1993). Accordingly, I have chosen two standard questionnaires as one means of collecting data.

The first questionnaire was developed by Reid (1987). It contains 30 questions divided into six parts: visual, auditory, kinesthetic, tactile, group learning, and individual learning. The questions are not, of course, given in such subgroups to avoid respondent bias. Some items from the original questionnaire were changed according to the information obtained during the pilot study. For instance, in the original questionnaire there was an item that asked: "I learn more when I make something for a class project." This item was left unattended by almost all participants of the pilot study. Afterwards, they all asked for explanation about the item. Thus in the new questionnaire, the item was changed into "I learn more when playing games in class" since in both instances the item intended to find out tactile preferences. Similarly, an item that asked "when I build something, I remember what I have learned better" was changed into "when I practice something, I remember what I have learned better" – another tactile preference. Still another item that asked "I prefer working on projects by myself" was changed into "I prefer working on assignments by myself" – an item for individual learning preference. The responses to the items were changed into scores which were worked out according to certain codes grouping like items together (see Appendix 1, page 80).

The second questionnaire was developed by Diaz Maggioli (1996). This type consists of 24 questions divided into three parts: visual, auditory, and tactile / kinesthetic. In this latter type the tactile and kinesthetic learning styles are fused together. Only one item was changed from the original questionnaire based on the information gathered during the pilot study. The only item that received complaints from most of the participants of the pilot study was one that asked, "I like to do things with my hands (like crafts and pottery)." This item was meant to assess tactile / kinesthetic learning style preference and was changed into "I like drawing pictures while studying" – still an item about tactile preference. Since there were no complaints against the other items, they were kept as before. The responses to the items were changed into scores which were worked out according to certain codes grouping like items together (see appendix 2, page 83).

A total of 390 questionnaires were returned from freshman students in the social science as well as the natural science streams. Out of this 215 were from students in the social science stream: 115 males and 100 females. From the natural science stream 175 students returned the questionnaires, out of which 105 were males and 70 females.

Students' responses were statistically analyzed in terms of preference means, and paired comparisons were applied. T-test was used to determine statistical significance at $p < 0.01$. The critical value of t at 0.01 level of significance was taken as 2.58. The t -test may be applied if the variances of the paired scores are nearly similar, and if the sample sizes are not markedly different. To be precise, Brown (1988: 166) states that a marked difference between sample sizes is meant a 3:1 or more difference. Accordingly, since the sample sizes compared fall well below this ratio, the assumptions necessary for the t -test are protected.

The other tool used for data collection was interview. As Ehrman (1996:63) states the “responses to questionnaire items on sensory channels usually serve as the basis for a discussion that leads to more than a simple set of percentage scores can.” Accordingly, out of the total number of students that completed the questionnaire (390), I interviewed 156 of them: 86 from the social science stream (46 males and 40 females), and 70 from the natural science stream (42 males and 28 females).

According to Merriam (1988) the researcher can use taping, recall, and note-taking while interviewing. Taping is thought to be intrusive during the interview and laborious during transcription. On the other hand, recall (writing notes from memory post-interview) is found undesirable by many because important points may be forgotten (Ibid.). The type favored by most including the present researcher would be the on the spot note taking. As Ehrman (1996: 40) states “the note taking is often itself a form of ‘listening’ or at least of ‘attending’.”

The interview questions were partly structured (adapted from Ehrman and Christensen, 1994) and partly open-ended (see Appendix 3, page 84-85).

3.2. Presentation and Discussion of Results

The results of the study have been tabulated and their interpretations have has also been discussed in the ensuing pages.

Table 1. Means of Scores for Social Science Students and Physical Science Students: First Questionnaire.

Stream	Statistic	Learning Style					
		Visual	Auditory	Kinesthetic	Tactile	Group	Individual
Social Science (N=215)	$\bar{X}$	42.30	28.70	39.40	27.10	21.35	39.85
	S	2.89	1.96	2.69	1.85	1.62	3.02
Natural Science (N=175)	$\bar{X}$	43.21	28.35	40.65	28.25	21.80	38.90
	S	3.21	2.14	3.08	2.14	1.49	2.66
	t_{obs}	2.88	1.67	4.55	5.61	2.83	3.26

Note: 1. $\bar{X}$ = preference mean for the group

S = standard deviation for the group

t_{obs} = the observed value of t

t_{crt} = the critical value of t at 0.01 level of significance, and its value is 2.58.

2. Preference means ($\bar{X}$) 36 and above = major learning style preference; means 25-36 = minor learning style preference; means of 24 or less = negative / negligible learning style preference.

Generally speaking most of the students from both streams showed a strong preference toward visual, kinesthetic, and individual learning styles. Tactile and auditory learning styles were considered only as minor preferences by the majority of the students from both streams. However, the majority of the students from both streams showed a negative learning preference toward group learning.

Visual Learning. As can be seen from the table visual learning preference received the highest mean value by students from both streams. Form the not so high standard deviation ($S = 2.89$ for students from the social science stream; $S = 3.21$ for students from the natural science stream), it may be said that the majority of the students' individual means were not very much different from the total mean. Thus it may be said that the majority of the students from both streams reported visual learning style as their strongest learning preference. This was also supported by the interview results whereby around 64% of the interviewees from the social science group, and 70% from the natural science group reported that they have to see things either in the chalkboard or on their notebooks before they could understand it.

This outcome may not be very surprising considering the fact that many other researchers into the area have come up with similar results. For instance, Ehrman (1996: 59) reports that she has found out most of her subjects to be visual strong: "Most of the learners with whom I deal put visual learning first"

It is ironic that most of the classroom instructions to date are not geared toward accommodating this kind of style. For example, Hodges (1982: 30-31) states that "approximately 90% of traditional classroom instruction is geared to the auditory learners. Teachers talk to their students, ask questions, and discuss facts. However... only 28% to 30% of any large group could remember 75% of what was presented through discussion."

It is also interesting to note that the students from the physical science stream were significantly more inclined toward visual learning style than their social science counterparts ($t_{\text{obs}} = 2.88 > t_{\text{crit}} = 2.58$ at $p < 0.01$). This might be because students from the hard sciences background have a tradition of "seeing" most things in their high school classes. For

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instance, they depend a lot on experimentation and proofs. What is more, even most of the theory they learn is illustrated with diagrams of some sort. Thus, this tradition might have had an effect on their preferred learning style. Similarly, the lack of class subjects that call for such tradition might have resulted in a relatively lower score obtained by the students from the social science group.

This difference was also supported by results from the interview where 85% of the interviewees from the natural science group reported that they take a lot of notes in class or lectures; whereas only 70% of the interviewees from the social science group agreed to this fact. Relatedly, 95% of the interviewees from the natural science group reported that they feel comfortable using charts, graphs, maps and the like; whereas only 75% of the interviewees from the social science group reported so. Yet again almost all of the interviewees (98%) from the natural science group reported that they like to be introduced to new material by reading about it first; whereas only 72% of the interviewees from the social science group agreed to this statement. Moreover, a majority of the interviewees (87%) from the natural science group reported that they forget things if not written down quickly; whereas only 69% of the interviewees from the social science group reported so. Finally, around 95% of the interviewees from the natural science group reported that writing things down helps their memory because mental images help them remember how the writing looks on the page; whereas only 65% of the interviewees from the social science group attested to this fact.

Auditory Learning. Contrary to what might have been expected, auditory learning style received only a minor preference by the majority of the students from both streams. As can be seen from Table 1, most of the students gave minor values which are not very much

different from the overall means. This is evident from the small standard deviations observed for both group ($S = 1.96$ for the social science group, and $S = 1.67$ for the natural science group). This fact may also be supported by the interview results where only a small number of the interviewees (45% from the social science group, and 40% from the natural science group) reported that they remember things better when talking about them – typical of auditory-strong learners.

These results are in line with what Ehrman (1996: 59) reports regarding the auditory modality: “Relatively few consider hearing their main channel, though of course they must rely on it when in natural language learning setting.”

There was not observed a statistically significant difference between the means for auditory learning preferences of the students from both streams ($t_{\text{obs}} = 1.67 < t_{\text{crit}} = 2.58$ at $p < 0.01$). It may thus be said that the students from both groups are equally bent toward this style and that they have shown it to be their minor preference.

This was also supported by results from the interview. Only a small number of the interviewees from both groups (49% from the social science group, and 46% from the natural science group) reported they feel comfortable with oral directions and interactions without any visual support. Similarly, only a minority of the interviewees from both groups (43% from the social science stream, and 39% from the natural science stream) reported that they don't mind when the teacher asks for books to be closed for a lesson. Moreover, a very small number of interviewees (44% from the social science group, and 45% from the natural science group) reported that they hear words when reading and that it is useful to talk through

a task. Finally, only 45% of the interviewees from the social science group and 47% from the natural science group stated that they like listening to dialogs on tape.

However, it may be interesting to note that despite the evidence which shows that only few students are interested to learn through an auditory channel, classes are still conducted in such a way that only the student with a strong auditory modality preference can benefit (Hodges, 1982).

Kinesthetic Learning. As can be seen from Table 1, kinesthetic learning style received the second highest score next to visual by a majority of the participants from both streams. Again the not so high standard deviations ($S = 2.69$ for the social science group; $S = 3.08$ for the natural science group) may indicate that most of the students' individual scores were not very far from the mean scores. This fact may also be supported by the interview results where a majority of the interviewees (70% from the social science group, and 72% from the natural science group) reported that they need frequent breaks from their study routines, and that they feel uncomfortable when asked to sit for a long stretch in class.

This finding seems to be in line with earlier findings where kinesthetic learning modality was rated as second by students (Ehrman, 1996: 59). It was also found that the score for the students from the natural science stream was significantly higher than that for those from the social science stream ($t_{\text{obs}} - 5.61 > t_{\text{crit}} = 2.58, p < 0.01$).

A possible reason for this difference might be that students in the natural science stream might have taken many class subjects that require laboratory work. Thus they might have had to move from class to class during those sessions. In addition, they might have had to do

“field work” in their school compound, say for their biology projects. Thus, this tradition of relative mobility might have resulted in the students’ kinesthetically higher score than their social science counterparts. On the other hand, there are hardly any courses in the social science curriculum for high schools that might require mobility from their classrooms, save probably for few geography lessons regarding different types of rocks to be collected from the field.

This significant difference in the scores between participants from the two groups was also accentuated by the interview results. For instance, a greater number of interviewees from the natural science group (69%) reported that their minds wander in class; whereas the number of interviewees from the social science group reporting the same thing was only 65%. Around 73% of the interviewees from the natural science group reported that they have trouble remembering conversational exchanges word for word (a feature for kinesthetic learners); whereas a lesser 70% of there social science counterparts attested to the same fact. Moreover, about 86% of the interviewees from the natural science stream reported that they would like to jump right into a task without taking much time for directions; whereas only 70% of their social science counterparts reported so. Finally, about 79% of the interviewees from the natural science group reported that they like activities where there is freedom of movement (such as games); where as only 65% of those from the social science group attested to this fact.

Tactile Learning. As can be seen from Table 1, tactile learning style received only a minor score by participants from both groups. The individual scores by participants were not very far from the mean scores ($s = 1.85$ for the social science group; $s = 2.14$ for the natural science group).

of the interviewees from the social science stream reported to have such a habit. Finally, 38% of the interviewees from the natural science group reported that they are overly familiar with everybody (yet another feature of a tactile learner); whereas only 29% of the interviewees from the social science group attested to this fact.

Group Learning. As can be seen from Table 1, group-learning style received the lowest score by the students from both groups. In fact, the mean scores were in the negative / negligible scale. The low standard deviations ($s = 1.49$ for the social science group; $s = 1.62$ for the natural science group) indicated that most of the students' individual scores were not very far from the mean scores. Thus it can be said that the majority of the participants from both groups reported group learning to be their least favored learning style. This fact was also supported by the interview results where a majority of the interviewees (72% from the social science group, and 76% from the natural science group) reported that one can't learn much from other students in groups and hence there is little teaching point in doing lots of group tasks.

This may be due to the competitive nature of the educational experience they might have had in their high school tradition as well as in their college stay. They had to compete to pass the national examination that would render them viable to join college. They also know what kind of stiff competition awaits them during their stay in college: Their first semester experience only adds to their premonition. Therefore, it can be said that students during their high school stay are pushed into competition rather than cooperation for fear that they might botch up their chances of passing examinations that would let them join college. Thus it may come as no big surprise if group work was rated low by most of the students in both groups.

On the other hand, many researchers laud group learning. For instance, Bailey et al. (1999: 71) suggest from their findings that “students who prefer to learn in cooperative groups to have lower levels of foreign language anxiety.” This is also in accord with those by Lightbown (1983), Long and Porter (1985), and Selinger (1983) who seem to agree that group work takes care of students’ affective demands, and may motivate them to use target language in conversation.

Similarly, Wright (1987) also suggests that group interaction might facilitate language learning. However, Holliday (1994: 54) warns that most of the literature on group interaction might not have considered “micro-social factors” and thus might not have taken into account “how classroom cultures in different social settings might react differently to English language methodologies.”

In a related work, Reid (1987: 97-98) found that almost all of his participants showed negative inclination toward group learning: “Every language background including English, gave group work a minor or a negative preference mean. She also suggests that “culture – in particular, previous educational experience – enters into student learning style preferences for group and individual learning” (Ibid.).

Similarly, Richards and Lockhart (1994: 54) report that a teacher who used a good number of pair and group activities in her class was given poor evaluation by her students. The students’ reaction was that “they could not see the point of such activities because they could not identify the teaching point” (Ibid.).

However, Rossi-Le (1995) found that among his participants Hispanics and mixed Asian students had a strong preference for group work. This goes to show that culture and previous experience play a part in students' choice of learning style preference.

The students from the natural science stream showed a significantly higher mean score than their social science counterparts ($t_{\text{obs}} - 2.83 > t_{\text{cpt}} = 2.58$ at $p > 0.01$) though the mean scores were on the minor / negligible scale in both cases. The reason for this higher score might be that these students might have been forced to study and work together out of class on subjects that call for calculations and problem solving activities – such being the nature of most hard science subjects. This high school experience might have stayed with some of the students even in their college semester.

The results of the interview also seemed to support the scores from the questionnaires. For instance, a greater percentage of students from the social science group (69%) reported that they feel anxious when the teacher asks them to get into groups; whereas a relatively smaller percentage from the natural science group (65%) agreed to this statement. Moreover, 65% of the interviewees from the social science stream reported that they often skipped group activities; whereas a relatively smaller 63% of the interviewees from the natural science group reported so. Similarly, 79% of the interviewees from the social science group stated that they hated it when they were asked to demonstrate in front of the class as a requirement of group interaction; whereas a lesser 75% of the interviewees from the natural science stream attested to this fact.

It may also be of interest to note that those interviewees who favored group work (though a minority especially among the males) stated that they would like to work with students who

would not dominate them (of lower achievement than their own?). This again only accentuates the fact that there is fierce competition among the students.

Individual Learning. As can be seen from Table 1, individual learning style received the third highest mean score next to visual and kinesthetic by students from both groups. These mean scores were in the major preference scale. The not so high standard deviations ($s = 3.02$ for the social science group, and $s = 2.66$ for the natural science group) may indicate that the majority of the respondents scored nearly as high as the mean scores. This was also supported by the high number of interviewees (75% from the social science group, and 71% from the natural science group) who stated that they prefer to study and work alone, and that they pretty much depend on the teacher rather than their peers.

These results seem to be in line with some of the findings by other researchers into the area. For instance, Vigna and Martin (1982) found that 84% of their high school participants preferred to work alone. On the other hand, Reid (1987: 98) found that “none of the language groups showed a strong (major) preference for individual learning.” Thus there are very strong indications that the choice for individual or group learning preference might be culture specific. To this end, Reid (1987: 98) reports that “English speakers rated individual learning as highest ... while Malaysian students ... had the lowest preference mean for individual learning.” Therefore, it might be said that the competitive nature of the participants’ previous and current experience might have had an influence on them to be highly inclined toward the individual learning style. Dorsey and Pierson (1984) only help to accentuate this fact when they conclude that age and previous experience influence choice of learning styles.

However, with regard to auditory learning style the mean scores are in the minor preference scale indicating that the majority of the students from both groups were not highly inclined toward the auditory learning style. Although the students from the social science group showed a slightly higher mean score, the difference was not big enough to warrant statistical significance ($t_{obs} = 1.63 < t_{crit} = 2.58$ at $p < 0.01$). Thus it may be said that students from both groups were almost equally bent toward this learning style.

Generally speaking there does not seem to be much difference in the results of scores between the two types of questionnaires. Thus it can be said that this consistency of results from both array of questions might help increase the reliability of the results thereby increasing the chances of their generalizability.

Table 3. Comparison of Means of Scores for Males and Females for Social Science Students: First Questionnaire.

Stream	Gender	Statistic	Learning Style					
			Visual	Auditory	Kinesthetic	Tactile	Group	Individual
Social Science (N = 175)	Male (n = 115)	$\bar{X}$	42.50	25.69	42.27	28.38	21.80	42.18
		S	3.98	2.41	3.96	2.66	1.83	3.95
	Female (n = 100)	$\bar{X}$	42.07	32.16	36.10	25.63	24.40	36.35
		S	4.23	3.23	3.63	2.58	2.45	4.37
		t _{obs}	0.76	16.44	11.90	7.68	16.27	8.98

Note: 1. $\bar{X}$ = preference mean for the group

S = standard deviation for the group

t_{obs} = the observed value of t

t_{crit} = the critical value of t at p < 0.01 is taken as 2.58.

2. Preference means ($\bar{X}$) 36 and above = major learning style preference;
means 25-36 = minor learning style preference, means 24 or less =
negative / negligible learning style preference.

Table 4. Comparison of Means of Scores for Males and Females for Natural Science Students: First Questionnaire.

Stream	Gender	Statistic	Learning Style					
			Visual	Auditory	Kinesthetic	Tactile	Group	Individual
Natural Science (N = 215)	Male (n = 105)	$\bar{X}$	43.42	25.31	42.99	29.44	19.68	41.38
		S	4.26	2.48	4.21	2.88	3.72	3.88
	Female (n = 70)	$\bar{X}$	42.89	32.91	37.13	26.46	23.85	36.05
		S	5.16	3.96	4.47	3.18	2.87	3.62
		t _{obs}	0.71	14.30	8.69	6.30	8.34	10.41

Note: 1. $\bar{X}$ = preference mean for the group

S = standard deviation for the group

t_{obs} = the observed value of t

t_{crt} = the critical value of t at $p < 0.01$ is taken as 2.58.

2. Preference means ($\bar{X}$) 36 and above = major learning style preference;
means 25-36 = minor learning style preference, means 24 or less =
negative / negligible learning style preference.

Visual Learning. As can be seen from Table 3, male students in the social science group were found to have a slightly higher preference with regard to visual learning style than females students. However, this difference was not big enough to warrant a statistical significance ($t_{\text{obs}} = 0.76 < t_{\text{crt}} = 2.58$ at $p < 0.01$). Similarly, from Table 4 it can be seen that male students in the natural science group showed a slightly higher mean score than their female counterparts. Still, this difference was not statistically significant ($t_{\text{obs}} = 0.71 < t_{\text{crt}} = 2.58$ at $p < 0.01$). Thus, for all practical reasons it may be said that male students were almost equally bent toward the visual learning style as their female counterparts in both groups. This fact may be interesting in that it may be against some of the earlier findings by some researchers into the field. For instance, Reid (1987: 94) had found that “males preferred visual learning ... significantly more than females.” This only goes to support the fact that learning styles may be very much influenced by cultural contexts such as previous learning experience: The participants in Reid’s case were studying in the United States.

The interview results also seemed to support the mean scores. Most of the female students interviewed (around 80% from the social science stream, and 85% from the natural science stream) stated that most of their instructors never write on the chalkboard as much as they would like them to. This may indicate that there may be “style wars” between learning and teaching since many of the students interviewed (64% from the social science group, and 70% from the natural science group) have reported to the effect that they have to see things

either in the chalkboard or on their notebooks before they could understand them (see discussion under Table 1). Many of the interviewees (90% males and 85% females from both groups) pinned the problem partly on the course book currently in use for Freshman English (that is, College English). They stated that the teacher just instructs them to do the exercises on the book one after the other, and that he hardly writes anything on the chalkboard. Some of the interviewees even went on to draw a grim picture: "There are instances where the teacher enters the class and leaves it without his hands even touching a piece of chalk let alone write with it." There seems to be a clear case of "style wars" going on between the students and the teachers. The lack of orientation with regard to the course book might have worsened the situation.

Auditory Learning. As mentioned in earlier discussions, the majority of the students in both streams seemed to have a low preference for auditory learning style irrespective of the fact that most of the lessons are geared toward such kind of learning style. However, female students showed a significantly higher preference for this style of learning than their male counterparts. As can be seen from Tables 3, the female students from the social science stream were markedly more bent toward this style than the male students with an observed value of $t = 16.44$, which is much higher than the critical value of $t = 2.58$ at $p < 0.01$. Similarly, from Table 4 it can be seen that the mean score for the female students from the natural science group showed a significantly higher difference compared to the mean of the male students from the same group ($t_{\text{obs}} = 14.3 > t_{\text{crit}} = 2.58$ at $p < 0.01$).

Research findings into gender and language learning also seem to support the above-discussed results. For instance, Leet-Pellegrini (1980), Aries (1976), and Fox (1990) suggest that women feel more comfortable when they assume listening roles.

The results from the interviews were not very much different. Around two thirds of the female interviewees from the social science stream and 60% from the natural science group reported that they remember things better when they discuss and talk about it; whereas only 25% of the male interviewees from the social science group and 27% from the natural science group attested to this fact. Similarly, around three quarters of the female interviewees (75% from the social science stream and 65% from the natural science group) stated that they would feel much happier if the teacher just talked throughout the lesson with their course books closed. On the other hand, only 15% of the male interviewees from the social science group and 22% from the natural science group agreed to this fact. Moreover, a good number of the female interviewees (70% from the social science group, and 63% from the natural science group) reported that they would prefer the teacher to tell them orally the instructions (directions) on how to complete a task rather than reading them from the book by themselves. However, only 31% of the male interviewees from the social science stream and 35% from the natural science stream agreed to this fact. Finally, almost all of the female interviewees from the social science group (about 80%) and 71% from the natural science group stated that they would like to listen to lots of taped conversations and especially to songs. On the contrary, only 15% of the male interviewees from the social science stream and 31% from the natural science group reported so.

The higher percentages of female interviewees inclined toward the auditory style were those from the social science group. This might have been due to the fact that most of the students joining the social science stream might have had a stronger exposure to English since most of them thought that English is important to survive in the stream: For instance, all of the female students interviewed from this stream chose English over mathematics in terms of

importance for college survival; whereas it was the opposite for those from the natural science stream.

Kinesthetic Learning. From earlier discussion on kinesthetic learning style, it was found that most of the students in both streams reported a higher preference from it. It can also be remembered that this figure was significantly higher for the students in the natural science group than for those in the social science group. With regard to scores according to gender, it can be seen from Tables 3 and 4 that male students in both streams were significantly more bent toward this style than their female counterparts. Accordingly, the value of t for the social science group was 11.9 which was much higher than the critical value of $t = 2.58$ at $p < 0.01$. Similarly, the observed value of t for the natural science group was 8.69, still much higher than the critical value of $t = 2.58$ at $p < 0.01$.

The lower preference by female students for this learning style might be explained by the fact that in most instances males are more spatially able than females. To this end, Hansen (1982) suggests that kinesthetic preference may be related to spatial ability usually attributed to masculinity.

The lower kinesthetic preference exhibited by the female students was also supported by reports from the interviewees. Most of the female interviewees (55% from the social science group and 67% from the natural science group) reported that they do not take frequent study breaks (a feature of a kinesthetic learner). They further stated that once they start studying they can sit it out for as long as necessary. On the other hand, 70% of the male interviewees from the social science group and 98% from the natural science group reported that they frequently interrupt their study or work to take breaks. They further stated that it is very

difficult for them to sit for a long stretch. Moreover, all the female interviewees from both streams reported that they would like to work in the same classroom without being asked to move around. They went on to suggest that lessons should be given consecutively without their having to change rooms. This might be the result of their previous learning experience where seats are fixed in almost all high school classrooms. In such instances it is mostly the boys who move from seat to seat and out of their rooms during class breaks. Furthermore, the majority of the female interviewees (62% from the social science group and 60% from the natural science group) reported that they have no problem remembering and producing dialogs word for word. This is typical of students who are low on the kinesthetic preference scale. Finally, most of the female interviewees (60 % from the social science stream and 59% from the natural science stream) reported that their mind rarely wanders in class and that they have little problem concentrating in class. This again is one typical feature of students who show low preference for kinesthetic learning style.

Tactile Learning. As can be seen from Tables 3 and 4, male students from both streams showed a significantly higher preference for tactile learning style than the females, though this style was found to be only a minor choice among the students as a whole. Specifically, the observed value of t for the students in the social science group was 7.68, while that for the natural science group was 6.30. In both cases the observed value of t was greater than the critical value of $t = 2.58$ at $p < 0.01$.

These results seemed to be in line with findings from other researchers into the area. For instance, Reid (1987: 94) also found that “males preferred ... tactile learning significantly more than females.”

This fact was also supported by the interview results. Only 40% of the female interviewees from the social science stream and 41% from the natural science stream reported to have had short concentration span. As discussed earlier, this is typical of tactile learners. Similarly, only 25% of the female interviewees from the social science stream and 30% from the natural science stream stated of having difficulty understanding abstract symbols. This again puts them under low category for tactile learning preference. Moreover, only 12% of the female interviewees from the social science group and 9% from the natural science group reported to have a kind of tic (such as playing with a lock of their hair). This is also supposed to be typical of tactile learners and the female students seemed to be low on it. Finally, only 28% of the female interviewees from the social science group and 34% from the natural science group reported of being overly familiar with everybody. Yet again it can be seen that only a minority of the female interviewees exhibited features of primarily tactile learners.

Group Learning. As can be seen from Tables 3 and 4, female student in both streams were found to have higher mean scores than their male counterparts with regard to group learning style. There was a marked statistically significant difference between the mean scores of both groups. The observed value of t for the natural science group was $8.34 >$ the critical value of $t = 2.58$ at $p < 0.01$. Thus, it may be said that female students in both groups were more inclined toward group learning style than the males.

This fact might be because of certain behavioral aspects that are gender related. For instance, many scholars into language learning and gender argue that female students work more cooperatively and less competitively than their male counterparts (Tannen, 1990; Oxford, Nyikos and Ehrman, 1988). Relatedly, Fox (1990) suggests that women feel more comfortable sharing their knowledge with others rather than competing with them.

Another reason might be that women are more bent toward finding out about the cultural and interpersonal aspects of the target language than men (Oxford, 1994). Thus, they may prefer working in groups to discuss more about the sociolinguistic aspect of the target language. Oxford (1994: 142) cites Belenky et al. (1986), and Maccoby and Jacklin (1974) in agreeing with the fact that female students prefer working cooperatively:

Women students tend to favor a two-way or networked exchange of ideas rather than a one-way, hierarchical, lecture-type flow of information from professor to student.

Thus, it may be said that female students might be more interested in tasks that involve cultural sensitivity and routes concerned with cooperative learning (Oxford, 1994).

The results from the interviews also seemed to support the mean scores. For instance, only 45% of the female interviewees from the social science group and 43% from the natural science group stated that one cannot learn much during group work. Thus, the majority of the female interviewees believed in the usefulness of group learning. Similarly, only 40% of the female interviewees from the social science stream and 38% from the natural science stream reported that they feel anxious when the teacher asks them to get into groups. This went to show that the majority of the female interviewees did not have any qualms about forming a group or participating in one. Moreover, only 37% of the female interviewees from the social science group and 35% from the natural science group reported to have often skipped group activities. This again showed that the majority of the female interviewees did not have any worries about participating in group activities. Finally, only 56% of the female interviewees

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from the social science group (compared to 91% male interviewees) and 51% from the natural science group (compared to 97% male interviewees) stated that they hated it when the teacher asked them to demonstrate in front of the class as a requirement of group interaction. Thus it can be seen that the female interviewees in both streams viewed group work in a much brighter light than their male counterparts.

It may also be interesting to note that the results from Tables 3 and 4 as well as the figures from the interviews show a consistently higher margin for the female students in the social science group compared to those in the natural science group. It may be that those students in the social science stream might have been a bit more outgoing during their high school stay than those in the natural science stream. It is very difficult to attribute this difference to previous learning experience regarding class subjects since the male students in the social science group showed a lower mean score than those in the natural science group.

Individual Learning. As can be seen from Tables 3 and 4, the female students in both streams were found to have lower mean scores than the male students with regard to individual learning style preference. In fact, the male students showed significantly higher mean scores than their female counterparts in both cases. The observed value of t was 8.98 for the social science group and 10.41 for the natural science group. In both instances the observed t value was much higher than the critical value of $t = 2.58$ at $p < 0.01$. Thus, it may be said that the female students in both groups showed a lower inclination toward the individual learning style.

It is only natural that the mean scores for this learning style were lower for the female students since in earlier discussion about group learning style female students showed a higher preference toward working cooperatively. To this end, research findings from

Maccoby and Jaclin (1974), Belenky et al. (1986), Oxford et al. (1988), and Tannen (1990) suggest that females prefer to work cooperatively rather than individually.

The results from the interviews seemed to support the above discussion. For instance, only 52% of the female interviewees from the social science group reported that they prefer to work and study alone (compared to a very high 95% of the male students who reported so). Similarly, only 32% of the female interviewees from the natural science group reported that they prefer to work and study alone (compared to a very high 95% of the male students who reported so). Similarly, only 32% of the female interviewees from the natural science group reported that they would rather work and study alone than in groups (compared to a very high 97% of the male interviewees who reported so). Therefore, it may be said that a majority of the female interviewees from both groups showed a negative preference for individual learning style.

Table 5. Comparison of Means of Scores for Males and Females for Social Science Students: Second Questionnaire.

Stream	Gender	Statistic	Learning Style		
			Visual	Auditory	Tactile / Kinesthetic
Social Science (N = 215)	Male (n = 115)	$\bar{X}$	39.02	23.96	39.15
		S	3.65	2.24	3.67
	Female (n = 100)	$\bar{X}$	38.65	26.30	36.14
		S	3.88	2.64	3.63
		t_{obs}	0.71	3.39	4.33

Note: 1. $\bar{X}$ = preference mean for the group

S = standard deviation for the group

t_{obs} = the observed value of t

t_{crt} = the critical value of t is taken as 2.58 at $p < 0.01$.

2. Preference means 34 and above = major learning style preference;
means 23-33 = minor learning style preference, means 22 or less =
negative / negligible learning style preference.

Table 6. Comparison of Means of Scores for Males and Females for Natural Science Students: Second Questionnaire.

Stream	Gender	Statistic	Learning Style		
			Visual	Auditory	Tactile / Kinesthetic
Natural Science (N = 175)	Male (n = 105)	$\bar{X}$	40.03	23.68	40.68
		s	3.93	2.32	3.98
	Female (n = 70)	$\bar{X}$	39.76	26.35	37.07
		s	4.78	3.17	4.46
		t_{obs}	0.39	6.04	5.47

Note: 1. $\bar{X}$ = mean score for the group

S = standard deviation for the group

t_{obs} = observed value of t

t_{crt} = the critical value of t is taken as 2.58 at $p < 0.01$.

2. Preference means 34 and above = major learning style preference;
means 23-33 = minor learning style preference, means 22 or less =
negative / negligible learning style preference.

As can be seen from Table 5, the female students from the social science stream showed a higher mean score for auditory learning style than their male counterparts. Apparently, the difference was big enough to warrant statistical significance with $t_{\text{obs}} = 3.34 > t_{\text{crt}} = 2.58$ at $p < 0.01$. Thus, it may be said that the female students in this group were more inclined toward

the auditory learning style than the males. On the other hand, the male students showed a higher mean score for the tactile / kinesthetic learning style than the females. The difference was statistically significant with $t_{obs} 4.33 > t_{crit} = 2.58$ at $p < 0.01$. As regards visual learning style, though the male students showed a slightly higher mean score than the females, this difference was not statistically significant with $t_{obs} = 0.71 < t_{crit} = 2.58$ at $p < 0.01$. Thus for all practical purposes it may be said that the female students in the group were equally bent toward visual learning style as their male counterparts.

Therefore, it can be said that the results from this second questionnaire regarding students from the social science group were not much different from those obtained by the first questionnaire as discussed in Table 3. This consistency might yet be one leap toward the generalizability of the results.

Similarly, it can be seen from Table 6 that the female students in the natural science group showed a higher mean score than the males with regard to auditory learning style. Again, the difference was found to be statistically significant with $t_{obs} = 6.04 > t_{crit} = 2.58$ at $p < 0.01$. Thus, it can be said that the female students in this group were more bent toward the auditory learning style than the males. On the other hand, the male students in the group showed a higher mean score than the females regarding tactile / kinesthetic learning style. The difference was found to be statistically significant with $t_{obs} = 5.47 > t_{crit} = 2.58$ at $p < 0.01$. Thus, it may be said that the male students in the group were more inclined toward this learning style than the females. Moreover, the male students in this group showed a slightly higher mean score than the females regarding visual learning style. However, the difference was not big enough to warrant statistical significance with $t_{obs} = 0.39 < t_{crit} = 2.58$ at $p < 0.01$.

ence, for all practical purposes it may be said that the female students in the group were equally inclined toward this learning style as their male counterparts.

Yet again the results from this second questionnaire were not much different from those obtained by the first questionnaire as discussed in Table 4. Thus, it may be said that the results were found to be consistent. This consistency might help toward the generalizability of the results.

CHAPTER FOUR

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This fourth and final chapter discusses possible implications in terms of conclusions drawn and recommendations forwarded. After the discussion about conclusion made based on results of the analyses of data, this chapter describes several recommendations that could possibly be forwarded to teachers and students alike, materials developers, curriculum designers, and teacher trainers.

4.1. Summary

As has been discussed in the first part of chapter three, a population of 390 students was taken to fill out the self-report questionnaires. Out of this population, 215 were from the social science stream and 175 from the natural science stream. A total of 156 students (86 from the social science stream and 70 from the natural science stream) were interviewed. The questionnaires were of two types: one consisted of items adapted from Reid (1987) and another one from Diaz Magioli (196). The interview items were adapted from Ehrman and Christensen (1994). The responses to the items were changed into scores and tabulated. These were later analyzed, and their interpretations discussed. The interview results were used as crutches to reinforce the results from the questionnaires.

4.2. Conclusions

The purpose of the study was to investigate which perceptual learning style preference were favored by the participants, and if there were any significant differences between the male students' and female students' choices.

First, it might be concluded that most of the students from both streams showed strong preferences toward visual, kinesthetic, and individual learning styles. The students from the natural science stream were significantly more inclined toward visual and kinesthetic style than their social science counterparts. Secondly, it may be concluded that most of the students from both streams showed only minor preferences with regard to tactile and auditory learning styles. Next, it may be said that the majority of the students from both streams harbored negative preferences against group learning style.

It can also be concluded that female students in both streams were significantly more inclined toward auditory and group learning styles than their male counterparts. On the other hand, it may be said that male students in both streams were significantly more inclined toward kinesthetic, tactile, and individual learning styles than their female counterparts.

Finally, it may be concluded that the instructional implications of the assessment of such perceptual learning style preferences are far reaching. Thus, the instructors would do well to diversify their instructional activities to accommodate as many preferences as possible.

4.3. Recommendations

During the research proceedings it was found out that students were keen on finding out their learning style preferences. Thus it would be in order if teachers took the time and interest to

have a focused group or whole class discussion to find out what their learning style preferences are. Such discussion would go one step toward avoiding any potential “style wars” (Oxford et al., 1993). It would also help students “recognize the power of understanding their language learning styles for making learning quicker, easier and more effective (Oxford and Anderson, 1995: 210). Similarly, Sims and Sims (1995) also recommend that teachers try to find out their students’ learning style preferences and make learning more effective by trying to approach those preferences when choosing activities.

The following recommendations may also be forwarded based on the results of the study:

1. The teacher might do well to try to match his style to those of different students’ by preparing a varied range of activities. To this end, many researchers such as Bialystock (1985) and Ellis (1989) recommend the necessity of matching instructional styles to students’ learning style preferences. For instance, Ellis (1989: 260) states that “matching is best achieved by the teacher catering for individual needs during the moment-by-moment process of teaching (i.e. by emphasizing group dynamics and offering a range of activity tapes).”

Many other researchers also believe in the advantages involved in matching students and instructors by styles though this might not be always practicable because of the large number of students and smaller number of teachers involved in second / foreign language programs (Wallace and Oxford, 1992). Oxford et al. (1991) suggest that the teacher should consciously choose activities in such a way that he would meet the need of the majority of his students. This would go one step toward ameliorating the style conflicts that are experienced most of the time – 82% of the time according to a study by Wallace and Oxford (1992). To this end, Oxford and Anderson (1995: 212) recommend that

teachers try to match their students' learning styles by meticulously planning "parts of every lesson to meet the need of diverse styles through judicious, creative lessons that highlight variety." Kang (1999: 9) is not very far from this when he recommends that "teachers should plan lessons to match students' learning styles while at the same time encouraging students to diversify their learning style preferences."

2. The teacher could also come up with activities that ask for different groupings. To this end, researchers such as Johnson et al. (1980), Slavin (1983) and Young (1985) suggest that teachers can group students according to their learning style preferences from time to time to achieve maximum efficiency while using style-varied groupings to achieve greater adaptability of learning styles.

3. The teacher could also encourage students to change their behavior from rigid-style-followers into flexible-style-users, and even to stretch their styles under the guidance of the teacher. The teacher could also have a focused group discussion or whole class discussion on which strategies are preferred by the students who favor which style and how these styles could be stretched. Researchers such as Oxford (1990), O'Malley and Chamot (1990), and Wenden and Rubin (1987) suggest of including instruction of strategies in the regular language classroom activities. Oxford (1990: 8) defines learning strategies as "specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, and more transferable to new situation." She recommends that teachers become aware of language teaching and learning strategies and use these expansions of knowledge to develop learning flexibility in their students.

This type of discussion and strategy instruction could also be used to help students develop their learning by achieving self-direction (Smith et al., 1990). Relatedly, Oxford

and Anderson (1995: 212) recommend that students understand what their preferred learning styles are and how to operate out of these styles: “As learners become aware of their own learning preferences, they can also become aware of things they can do to stretch their learning styles.”

4. Yet another way of helping improve the effectiveness of second / foreign language programs in tertiary classrooms may be to change the physical setting from time to time. For instance, having chairs arranged in a semi-circle rather than in the conventional rows would be more appealing to students to work in small groups, and thus improving their preference for this learning style (Oxford et al., 1993).
5. It may also be suggested that curriculum designers and materials developers for teacher education institutions include activities that would help the prospective teachers to identify students' learning styles. Oxford and Anderson (1995:201) contend that the teacher may not be “necessarily at fault” since “many teacher education programs do not provide the kind of experiences that would allow prospective teachers to develop their skills in identifying students' learning styles and in handling crosscultural differences.”
6. Finally, it may be in order to include a sample of an activity that teachers could use to incorporate as many perpetual learning modalities as possible. One such sample is taken from Diaz Maggiol: (1996: 35-37):

The plan has four stages. The first stage of the task (and class) is the hook. Taking the students' backgrounds into account, the teacher helps the learners understand the purpose

of the task so they can approach it in a focused and self-directed way ... It is at this stage that the teacher helps students set realistic goals for themselves.

The second stage is mediation where the teacher shows the significance of the task proposed and helps learners discover its value ... Hence, the main aim of this stage is to have students reflect on the task and to show them the steps that must be taken to complete it.

In the third stage, application, the teacher provides opportunities for the learners to perceive that a change has occurred as a result of having learned something new.

The last stage has been termed personalization and it is here that students realize that what they have learned will be useful for future tasks. This gives the learning experience the transcendence it deserves.

Word to Picture

Modality:

- a. Visual
- b. Auditory
- c. Tactile / kinesthetic
- d. Group

Timing: 30 minutes

Level: All

Preparation: Select collection of pictures depicting various landscapes (one picture per student)

Learning styles in general and perceptual learning styles in particular are too important to be ignored. It is high time that instructors and materials developers take this to heart and plan accordingly. More often than not instructors view students' difficulties as being inherent and hence out of their control instead of as being due to a mismatch between their teaching styles and the students' learning styles (Cuban, 1989; Nuby, 1995). When teachers rigidly follow their own teaching styles irrespective of the students' learning preferences, there definitely will follow conflicts (Oxford, Ehrman, and Levine, 1991). What is even more serious may be that teachers would start harboring partiality toward those students whose learning styles seem like theirs, thereby committing a kind of educational prejudice (Claxton and Murrell, 1987). Therefore, it cannot be reiterated enough that instructors take the time (or else make the time) to assess their students' learning style preferences (perceptual or otherwise) in an effort to match them as much and as many times as possible. In addition, teachers would also do well to consider "the gender balance, age range, and cultural backgrounds of the students" when choosing "the most appropriate teaching style" (Bress, 2000: 28).

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Aims: To create memorable, personal associations with new vocabulary items and to foster cooperation.

1. HOOK

Display the pictures and allow students time to choose one they feel they can truly connect with. Then let students observe the picture and try to create a sequence of sounds for it. In pairs, students describe their pictures by giving their sound sequence only.

2. MEDIATION

The teacher explains to the students that words can have associations, and their meaning is best recalled when those associations are personal. Give some examples from your own experience, and invite students to do the same.

3. APPLICATION

Students choose new words they would like to learn. Ask them to keep their choice to a maximum of 10. They then write each word on a piece of paper, and pin it to an item in the picture to which they can associate the word. In groups, students tell each other about their associations. If students are used to keeping a learning log or a class dictionary, the words could be added to them.

4. PERSONALIZATION

Students work in groups again, this time writing a collective story using some of the words they have learned and one or more of the pictures.

Learning styles in general and perceptual learning styles in particular are too important to be ignored. It is high time that instructors and materials developers take this to heart and plan accordingly. More often than not instructors view students' difficulties as being inherent and hence out of their control instead of as being due to a mismatch between their teaching styles and the students' learning styles (Cuban, 1989; Nuby, 1995). When teachers rigidly follow their own teaching styles irrespective of the students' learning preferences, there definitely will follow conflicts (Oxford, Ehrman, and Levine, 1991). What is even more serious may be that teachers would start harboring partiality toward those students whose learning styles seem like theirs, thereby committing a kind of educational prejudice (Claxton and Murrell, 1987). Therefore, it cannot be reiterated enough that instructors take the time (or else make the time) to assess their students' learning style preferences (perceptual or otherwise) in an effort to match them as much and as many times as possible. In addition, teachers would also do well to consider "the gender balance, age range, and cultural backgrounds of the students" when choosing "the most appropriate teaching style" (Bress, 2000: 28).

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APPENDICES

APPENDIX 1

The following is the first questionnaire and how the scores were calculated.

Perceptual Learning Style Preference Questionnaire

Directions: This questionnaire has been designed to help you identify the way(s) you learn best-the way(s) you prefer to learn. Read each statements on the following pages. Please respond to the statements AS THEY APPLY TO YOUR STUDY OF ENGLISH. Decide whether you agree or disagree with each statement. For example, if you “strongly agree” mark,

Strongly agree	Agree	Undecided	Disagree	Strongly disagree
X				

Please respond to each statement quickly, without too much thought. Try not to change your responses after you choose them. Please use a pen to mark your choices. Thank you.

Stream _____

Sex _____

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1. When the teacher tells me the instructions, I understand better.					
2. I prefer to learn by doing in class.					
3. I get more work done when I work with others.					
4. I learn better when I study with a group.					
5. In class, I learn best when I work with others.					
6. I learn better by reading what the teacher writes on the chalkboard.					
7. When someone tells me how to do something in class, I learn it better.					
8. When I do things in class, I learn better.					
9. I remember things I have heard in class better than things I have read.					
10. When I read instructions, I remember them better.					
11. I like drawing doodles in my notebook.					
12. I understand better when I read instructions.					
13. When I study alone, I remember things better.					
14. I learn more when playing games in class.					
15. I enjoy learning in class by participating in drama activities.					
16. I learn better when I make drawings as I study.					
17. I learn better in class when the teacher gives a lecture.					
18. When I work alone, I learn better.					
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree

19. I understand thing better in class when I participate in role playing.					
20. I learn better in class when I listen to someone.					
21. I enjoy working on a assignment with two or three classmates.					
22. When I practice something, I remember what I have learned better.					
23. I prefer to study with others.					
24. I learn better by reading than by listening to someone.					
25. I enjoy participating in role plays.					
26. I learn best in class when I can participate in related activities.					
27. In class, I work better when I work alone.					
28. I prefer working on assignments by myself.					
29. I learn more by reading textbooks than by listening to lectures.					
30. I prefer to work by myself.					

The questions are scored this way:

SA	A	U	D	SD
5	4	3	2	1

Visual

6 _____
10 _____
12 _____
24 _____
29 _____

Total _____ x2 = _____ (Score)

Tactile

11 _____
14 _____
16 _____
22 _____
25 _____

Total _____ x2 = _____ (Score)

Auditory

1 _____
7 _____
9 _____
17 _____
20 _____

Total _____ x2 = _____ (Score)

Group

3 _____
4 _____
5 _____
21 _____
23 _____

Total _____ x2 = _____ (Score)

Kinesthetic

2 _____
8 _____
15 _____
19 _____
26 _____

Total _____ x2 = _____ (Score)

Individual

13 _____
18 _____
27 _____
28 _____
30 _____

Total _____ x2 = _____ (Score)

Major Learning Style Preference 36-50

Minor Learning Style Preference 25-35

Negligible (or Negative) 0-24

Visual

Total _____ x2 = _____ (Score)

Auditory

Total _____ x2 = _____ (Score)

Kinesthetic

Total _____ x2 = _____ (Score)

Tactile

11 _____
14 _____
16 _____
22 _____
25 _____

Total _____ x2 = _____ (Score)

Group

3 _____
4 _____
5 _____
21 _____
23 _____

Total _____ x2 = _____ (Score)

Individual

13 _____
18 _____
27 _____
28 _____
30 _____

Total _____ x2 = _____ (Score)

Major Learning Style Preference 36-50

Minor Learning Style Preference 25-35

Negligible (or Negative) 0-24

The following is the second questionnaire and how the scores were calculated.

What is your Learning Line?

Directions: Read the following statements and indicate how much they apply to you: 1 – Never; 2 – Not much; 3 - a little; 4 - a lot. Remember there are no right or wrong answers. Please respond to each statement quickly, without too much thought. Try not to change your responses after you choose them. Please use a pen to mark your choices. Thank you.

1. I enjoy learning in class with my friends.
2. I like to learn on my own by studying and thinking.
3. I want the teacher to correct all my mistakes.
4. I enjoy working in groups in class.
5. I like to have a neat and orderly desk.
6. I think that a good teacher should be friendly.
7. I think that a good teacher is demanding.
8. A good teacher brings games to play in class.
9. I like to tell jokes.
10. I like to talk to the teacher outside class.
11. I generally decorate the inside of my notebook cover with drawings.

Never	Not much	A little	A lot
Never	Not much	A little	A lot

with drawings.

12. I like music and rhythm in order to learn better.

13. I fell better when I have my own books and materials.

14. I like drawing pictures while studying.

15. I talk too much in class.

16. My classmates think I am funny and friendly.

17. My classmates think I am shy.

18. My teachers think I am a very good student.

19. My teachers think I never study.

20. My teachers think I move too much in class.

21. I like to read in my free time.

22. I like to talk to friends and tell jokes in my free time.

23. I like to practice sports in my free time.

24. While I am studying, I frequently stop ad do other things.

The questions were scored this way:

N	NM	L	AL
0	1	2	3

Visual

2 _____

4 _____

6 _____

9 _____

12 _____

15 _____

16 _____

Tactile / Kinesthetic

8 _____

10 _____

11 _____

14 _____

19 _____

20 _____

23 _____

21 _____

Total _____ x2 = _____ (Score)

24 _____

Total _____ x2 = _____ (Score)

Auditory

1 _____

3 _____

5 _____

7 _____

13 _____

17 _____

18 _____

22 _____

Total _____ x2 = _____ (Score)

Major Learning Style Preference 34-48

Minor Learning Style Preference 23-33

Negligible (negative) 0-22

APPENDIX 3

The following were the questions incorporating the structured interview to which students were supposed to answer 'yes' or 'no' and explain / elaborate if necessary.

Visual

1. Do you have to see things on the chalkboard before they could make sense to you?
2. Do you have to see things on your notebook before you could understand it?
3. Do you take lots of notes in class or lectures?
4. How comfortable are you when using charts, graphs and the like as a point of learning?
5. Do you forget things quickly if not taken down?
6. Do you think writing things down helps your memory?

Auditory

1. Do you remember things better when talking about them?
2. Does oral direction during activities make you feel comfortable?
3. How do you feel if the teacher orders your books closed during a lesson?
4. Do you hear the words when you read?
5. How do you feel about lots of listening activities from tapes?

long stretches without taking breaks during a study routine?

and wander during class?

number a conversational exchange word for word?

time before starting a task?

and about games and role plays in class?

conversation span?

difficulty understanding abstract symbols?

kind of tic (such as twisting a lock of your hair)?

most of your classmates real close?

can learn anything from your peers?

when asked to form groups?

joined a group activity?

when asked to demonstrate in front of your class?

Declaration

The thesis is my original work, has not been presented for a degree in any other university and that all sources of material used for the thesis have been duly acknowledged.

Name: Samuel Tesfamichael

Signature: 