

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 Introduction**

The aim of this study is to develop a comprehensive understanding of perceived language learning strategy used by secondary school students in suburban areas. This chapter will therefore explain the quantitative nature of this study which will try to sequence the connections between the empirical data and the initial research questions of the present study. Initially, it will attempt to give an explanation to the theoretical framework of learning strategies inquired and the methods for collecting the quantitative data of the study. This is followed by descriptions about the characteristics of the sample group that is selected using stratified sampling. Next, the reliability and validity of the translated SILL into Malay Language employed for the study is discussed with two pilot tests conducted on it. The final section will describe the involvement of administering the SILL questionnaires to the samples and the timeliness involved, ending with a framework description of the data analysis collected through SILL (Oxford, 1990) as an instrument. This will give the researcher an in-depth understanding of the learning strategies used by the students in a language classroom and will also provide valuable input to find out whether variables such as gender and school level show any significant difference towards the language learning strategy used.

### **3.2 Theoretical Framework**

The theoretical framework of this study derives from previous researches done by Rubin (1978), O'Malley (1987) and Oxford (1990). Rubin (1978) has come to an understanding that there are actually three kinds of learner strategies. They are the learning strategies, the communication strategies and social strategies. Among these three, the first two are further named as direct strategies because they make direct and primary contribution to language learning, by means of obtaining, storing, retrieving and using language, as opposed to the indirect way in which social strategies contribute to language learning.

As the first and major category, learning strategies may further break into cognitive and metacognitive strategies. O' Malley (1987) explains that the former normally entail direct manipulation or organization of new information. Some typical examples of the cognitive strategies are repetition, resourcing, translation, grouping, note-taking, deducing and inferencing. However, on the other hand, metacognitive strategies often include planning, monitoring, and evaluating learning activities.

The second category in Rubin's (1987) system of typology, communication strategies are often employed when learners participate a conversation, facilitating the on-going of conversation and allowing learners more chances of exposure to the second language, such as clarification strategy and avoidance strategy. The last one, social strategies are applied with a lower frequency in classroom activities. Take for instance, cooperating with peer learners in group work and asking teachers for clarification, due to

lack of real life communicative situations and inevitable resort to mother tongue. They co-appear with affective strategies in lots of strategy research reports (Carless, 2007).

Although the primary and significant aspects of learner strategies have been covered in Rubin's (1987) categorization, some specific strategies owning their importance in second language learning deserve particular attention. Take mnemonic techniques for instance, they are applied and relied on to some degree in lots of language learning areas. Deployed with other aides in a learning setting, like visual aids and physical responses (Thompson, 1987), memorizing strategies could be particularly effective to some learners.

Tudor (1996), Jones (1998) and Rausch (2000) agree that Oxford's (1990) classification of language learning strategies is more detailed and comprehensive, as compared to earlier classifications. Besides, Ellis (1994) regards Oxford's (1990) classification as perhaps the most comprehensive classification to date. There are six main categories of language learning strategies proposed by Oxford (1990), comprising of memory strategies, cognitive strategies, compensation strategies, metacognitive strategies, affective strategies and social strategies. Consequently, the SILL (Strategy Inventory Language Learning) developed by Oxford (1990) is used as a research instrument to investigate the language learning strategies used among the upper and lower form students as well as between the students' genders.

In Oxford's framework, she divided her six factors into two. The two sets of taxonomy on language learning strategies are classified as direct and indirect learning strategies. Direct learning strategies entail a mental process of receiving, retaining, storing, and retrieving the words or other aspects of the target language whereas in indirect learning strategies, it is more on organization of learning through activities that facilitate the learner in regulating thoughts and feelings (Rausch, 2000).

The first type of taxonomy, the direct learning strategies emphasizes memory, cognitive and compensation strategies. It – involves direct learning and use of the subject matter, in this case a new language (Oxford, 1990). The memory strategies are more focused on the memorization of words or word recall while the cognitive strategy are the mental strategy learners use to make sense of their learning. Memory strategies are those used for storage of information (Hismanoglu, 2000). It is said that insensitive use of memory strategies by EFL learners may indicate that it is a cultural habit because just like the Australian students, they revealed that remembering difficult words was not effective as opposed to Indonesians who confessed that they have a habit of rote learning behavior (Lengkanawati, 2004). This specific strategy is useful for quickly learning vocabularies—which is important especially in the beginning and intermediate stages of language learning but not necessarily later (Oxford, Cho, Leung, & Kim, 2004).

Compensation strategies help learners to overcome knowledge gaps to continue the communication by switching to the mother tongue, using other clues, getting help and using a synonym (Hismanoglu, 2000; Shamis, 2002). It deals with the mind or the

cognitive aspect of the individual. Compensation strategies include behaviors such as guessing intelligently and overcoming limitations in speaking and writing (Hismanoglu, 2000). Yang's study (2007) stated that compensation strategies are the most frequent strategies Chinese learners use because they allow a great opportunity to guess the meaning despite of having limited grammatical and vocabulary knowledge.

Cognitive strategies are more direct in manipulation of the learning material. Repetition is the key to achieve successes in learning a language and actions such as translation, note taking, key words and the like are encouraged in order to achieve this factor (O'Malley, Stewner-Manzanares, Russo, & Küpper, 1985).

The second type of taxonomy is the indirect learning strategies which include metacognitive, affective and social strategies (Hismanaoglu, 2000). Indirect strategies — contribute indirectly but powerfully to learning (Oxford, 1990). The metacognitive strategy is applying skills in organizing plans, monitoring one's production or simply self-monitoring (O'Malley et al., 1985). Metacognitive strategies analyze one's mistake and not trying to make the same mistake again in the future that's why metacognitive strategies are developmental in nature. The findings of Liu's study (2004) revealed that when metacognition is highly used, it can provide a way for learners to coordinate their own learning process by planning, constant monitoring and evaluating (Oxford 1990). It implies that seeking opportunities keeps the EFL learners on track of their learning which is considered crucial given the poor environment such as the Philippines (Liu, 2004).

Next would be the affective strategy. Affective strategies are concerned with the learner's emotional requirements such as confidence. Stern (1992) stated in his study that — good language learners are more or less conscious of these emotional problems. In this case, it is believed that emotions can affect one's learning too (Hismanoglu, 2000). In learning a foreign language there are some instances whereby a learner may feel negative emotions along the way. A study revealed that the affect part of a learner can hinder or slow down learning process, for instance anxiety (Ariza, 2002). This emotion creates discomfort and fear—fear of committing mistakes or fear of socializing with others is one of the examples of anxiety. In addition, Oxford (1990) emphasized that it is possible that learners are not familiar with paying attention to their own feeling. But it is noteworthy that this strategy is helpful when learners are anxious or is in need for a motivational boost therefore, high-proficiency learners may not require these strategies very much (Oxford, Cho, Leung, & Kim, 2004). The last factor for the indirect strategies would be the social strategies. As the word implies, social strategies deal with the people surrounding the learner and the environment as well. Social strategies lead to increased interaction with the target language (Hismanoglu, 2000). Social strategies are — activities which give them opportunities to be exposed to and practice their knowledge as described by Wenden and Rubin's study (1987).

The next section presents a language learning strategy diagram of Oxford's (1990, pp. 20 – 21) classification. It consists of six main strategy groups and nineteen sub-strategies as presented in Diagram 3.1:

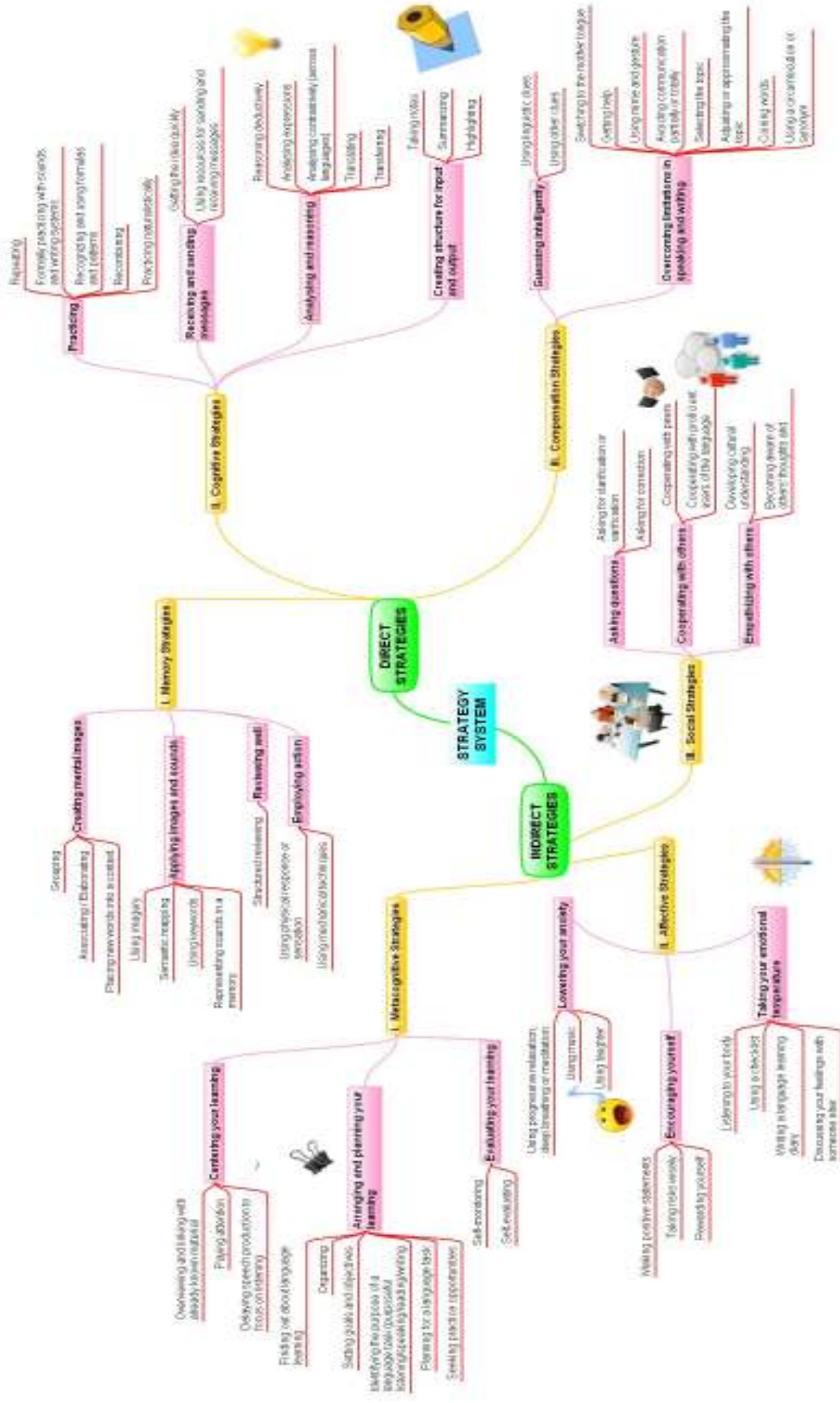


Diagram 3.1: Mindmap of Strategy System

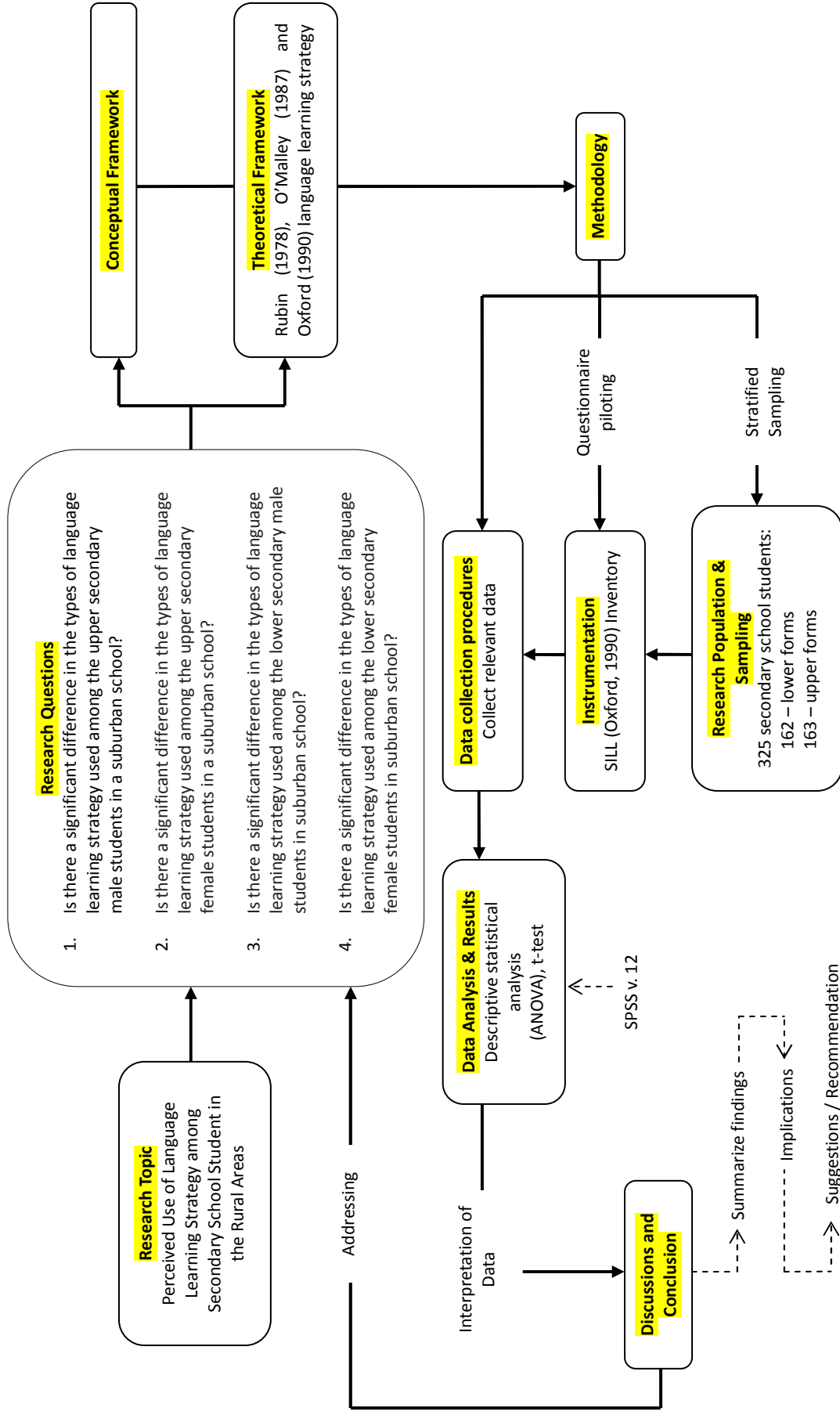
### **3.3 Research Design**

This descriptive study is designed to investigate what are the language learning strategies perceived by the secondary school students in rural areas in regard to their gender and school level. As shown in Figure 3.3, the underlying theories presented by Rubin (1978), O'Malley (1987) and Oxford (1990) as well as the exertion of Oxford's (1990) Strategy System as the conceptual idea, are the frameworks that orchestra the present study to explore further characteristic details of the variables to be investigated. They are the theoretical roots that reflect the blueprint of this study.

Figure 3.3 also shows that this quantitative study utilizes a linear research design that structures the major parts of the research project – the population samples, research instrumentation, data collection procedures and analysis – working together to try to address the central research questions in its final part of discussion and conclusion. Hence, this research design is a methodological action plan that will help the researcher to lay out the study's major components for the conduct of this research project.

The major components in its methodological stage are the research sampling, instrumentation and data collection procedures that will try to quantify the relationship between language learning strategies perceived with the students' genders and school levels. A descriptive study is, therefore, a study that is enhanced by data analysis to explain the phenomenon of a study (Van Dalon, 1979). Thus, a data analytical framework will finalize the establishment of data's objectivity, questions, hypothesis, its sources, types and techniques for the analysis.





**Figure 3.2: Research Design**

### **3.4 Research Population and Sampling**

#### *3.4.1 Background of Population and Sample*

The research population for this study compromise of 325 respondents, sampled out of a total population of 1,003 students (Appendix A) from SMK Saratok – a suburban secondary school which is situated 54 kilometres away from the Betong Educational Office. These students learn English as their second language ever since their primary school education.

Out of the total sample, 162 students are sampled from the lower forms and 163 students are from the upper forms. The upper form students are those from the Form 4 and 5, their age ranging from 16 to 17 years old whereas the lower forms students are from those in Form 1, 2 and 3 with age range between 13 to 15 years old. As such, this student population has to be stratified for selection within subgroups – by gender, into male and female; and by school level, into lower and upper forms.

Table 3.1 shows the distribution of the male and female population from the upper and lower forms in the school. From the total population of each school level, the total percentage of male and female respondents are then calculated and stratified according to their gender groups.

**Table 3.1: Distribution of the Total Population in School according to Gender and School Level**

	Female (n = 521)	Male (n = 482)	N
<i>Lower Form</i>			
Form 1	139	113	252
Form 2	98	98	196
Form 3	107	97	204
<i>Total Population</i>	344	308	652
<i>Upper Form</i>			
Form 4	91	91	182
Form 5	86	83	169
<i>Total Population</i>	177	174	351

#### 3.4.2 Demographic Profile of Respondents

Table 3.2 presents the demographic profile of the respondents from the upper and lower forms. The results indicate that 21% of the female gender will represent Form 1, 15% will represent Form 2 and another 16% represents the Form 3 whereas for the upper forms, 26% of the female gender will represent the Form 4 and another 25% will represent the Form 5. For the lower form students, 17% of the male respondents will represent the Form 1, 15% will represent Form 2 and another 15% represents the Form 3. Meanwhile for the upper, 26% of the male respondents will represent Form 4 and 24% will represent the Form 5 male respondents.

**Table 3.2: Demographic Profile of the Respondents**

Gender	School Level	n/N (x 100%)	%
<i>Female</i>	<i>Lower Form</i>		
	Form 1	139/652	21.32
	Form 2	98/652	15.03
	Form 3	107/652	16.41
	<i>Upper Form</i>		
	Form 4	91/351	25.92
	Form 5	86/351	24.50
<i>Male</i>	<i>Lower Form</i>		
	Form 1	113/652	17.33
	Form 2	98/652	15.03
	Form 3	97/652	14.87
	<i>Upper Form</i>		
	Form 4	91/351	25.92
	Form 5	83/351	23.64

### 3.4.3 Sampling

The sample of students for this study is selected by using stratified sampling since the population is going to be divided into relatively homogeneous subgroups. The advantage of stratified sampling is that it ensures better coverage of the population and it is often convenient to stratify a sample that deals with gender, school level and the second language achievement. Though it may require some administrative effort to know the proportion for each stratum in the population, proportionate stratification provides equal or better precision than simple random sample of the same size. In other words, it is used to obtain greater degree of representativeness while decreasing probable sampling error.

Thus, this sampling method is chosen for the present study to ensure that an adequate number of respondents are selected from each subgroup as shown in Table 3.3 below:

**Table 3.3: Stratified Sampling of Respondents according to Gender and School Level**

	<i>Female</i>		<i>Male</i>	
	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>
<b><i>Lower Form</i></b> ( <i>n = 162</i> )				
Form 1	21.32	35	17.33	28
Form 2	15.03	24	15.03	24
Form 3	16.41	27	14.87	24
<b><i>Upper Form</i></b> ( <i>n = 163</i> )				
Form 4	25.92	42	25.92	42
Form 5	24.50	40	23.64	39

Table 3.4 is a summary of samples that have been stratified and distributed according to the students' gender and school level. As shown, these various subgroups are represented at an appropriate relative frequency and this ensures that they are also properly represented in the statistical analysis.

**Table 3.4: Summary of Samples distributed according to Gender and School Level**

	<i>N of Respondents = 325</i>				
	<i>Lower Form</i> ( <i>n = 162</i> )			<i>Upper Form</i> ( <i>n = 163</i> )	
	Form 1	Form 2	Form 3	Form 4	Form 5
<b><i>Gender</i></b>					
Female	35	24	27	42	40
Male	28	24	24	42	39

Finally, the number of respondents for each subgroup is selected using the systematic sample method by taking every fifth (5<sup>th</sup>) name from the students' name lists in each of the lower and upper forms according to their gender group.

### **3.5 Instrumentation**

This study employs Strategy Inventory Language Learning (SILL) which is developed by Oxford (1990). Moreover, results depend heavily on the quality of the measurement (MacMillan & Schumacher, 2001). Details of the instrument are described as below.

#### *3.5.1 Questionnaire – Strategy Inventory Language Learning (SILL)*

SILL has been used extensively to collect data on large numbers of mostly foreign language learners (Olivares-Cuhat, 2002; Wharton, 2000; Oxford and Burry-Stock, 1995; Oxford, 1990; 1996, in Cohen and Macaro, 2007). It is a standardized measure with versions for students of a variety of languages, and as such can be used to collect and analyze information about large numbers of language learners. It has also been used in studies that correlate strategy use with variables such as learning styles, gender, proficiency level, and culture (Brien, 2001; Wharton, 2000; Bedell and Oxford, 1996; Green and Oxford, 1995; Oxford and Burry-Stock, 1995, cited in Chamot, 2004).

As claimed by Oxford and Burry-stock (1995), one of the most appropriate ways to assess the use of language learning strategies was using summative rating scale or known as a questionnaire. The SILL has two versions – version 5.0 is for the native speakers of English learning foreign languages and 7.0 is for ESL/EFL students of second and foreign languages. The SILL (version 7.0) has 50 items containing 5 Likert-scale to

report the frequency of language learning strategies perceived by the sample groups of students. Each item entails following descriptions:

- 1 = never or almost never true of me;
- 2 = generally not true of me;
- 3 = somewhat true of me;
- 4 = generally true of me;
- 5 = always or almost true of me.

The SILL contains sections of items that represent Oxford (1990's) classification of language learning strategies including six main categories as described in the table below:

**Table 3.1: SILL Items and Categories**

<i>Part</i>	<i>Item</i>	<i>Categories</i>	<i>Description</i>
A	1 – 9	Memory strategies	Creating mental images Applying Images and sounds Reviewing well Employing action
B	10 – 23	Cognitive strategies	Practicing Receiving and sending message Analyzing and reasoning Creating structure for input and output
C	24 – 29	Compensation strategies	Guessing intellectually Overcoming limitations in speaking and writing
D	30 – 38	Metacognitive strategies	Centering learning

**Table 3.1: SILL Items and Categories (cont'd)**

<i>Part</i>	<i>Item</i>	<i>Categories</i>	<i>Description</i>
			Arranging and planning learning Evaluating learning
E	39 – 44	Affective strategies	Lowering anxiety Encouraging yourself Taking your emotional temperature
F	45 – 50	Social strategies	Asking questions Cooperating with others Empathizing with others

The SILL range of frequency is determined by a criterion diagram below:

**Table 3.6: SILL Range of Frequency**

<i>Frequency</i>	<i>Level</i>	<i>Average Mean score</i>
Always or almost always used	High	4.50 – 5.00
Usually used		3.50 – 4.49
Sometimes used	Medium	2.50 – 3.49
Generally used		1.50 – 2.49
Never or almost never used	Low	1.00 – 1.49



### 3.5.2 *Reliability and Validity of the SILL questionnaires*

The SILL has been recognized as the most comprehensive learning strategies (Ellis, 1994). It has been translated into more than 20 languages and has been used widely around the world because it allows comparison for the study (Bremner, 1999).

Reliability indicates the consistency of a measure. An instrument is regarded as reliable as it yields the same result repeatedly (Richards, Platt & Platt, 1999). Oxford and Burry-stock (1995) state that the SILL has high content validity and construct validity. Besides, MacMillian and Shumacher (2001) also state that strong measurement increases confidence in a finding. Consequently, the SILL has been proven for its high reliability and validity. Its Cronbach's alpha reliability coefficient ranges from 0.86 – 0.96 (Ellis, 1994; Griffiths, 2003).

Validity is what an instrument measures as it is claimed to measure (Bachman & Palmer, 1996). It is very important for an instrument to be valid in order for the results to be accurate (Richards, Platt & Platt, 1999). There are several aspects which justify validity, criterion-related validity and construct validity (Oxford & Burry-stock, 1995). Although the internal consistency of the SILL has been tested worldwide (Oxford, 1986; Watanabe, 1990; Yang, 1992; Oxford and Burry-stock, 1995; Satta-udon, 2007; Suwannaprut, 2007), the questionnaires have been tested and revised (Appendix B and C) following two pilot tests by the researcher.

### 3.5.3 *The Translated Version of SILL Inventory*

Initially, the SILL inventory has been translated by the researcher into the *Bahasa Malaysia* (Appendix C) to minimize the effect of misinterpretation of items by the subjects. Besides, it is the language that the students are most comfortable with and less intimidated. In addition, students will be able to fully understand the statements in their own context. The Dewan Bahasa & Pustaka *Kamus Dwibahasa* (bilingual language dictionary) *Bahasa Inggeris – Bahasa Melayu*, (third edition) is used as a reliable dictionary during the translation process. It has been printed for three times since 1991 and the treatment of the entries is detailed and unique in such a way that it provides Malay equivalents for each English word, phrase or idiom, based on context and usage.

The translated version of SILL has also been edited by two English Language teachers who are also orally proficient in the Malay Language and have been teaching for more than 5 years. Finally, the first draft of the translated SILL questionnaire is given to another two experienced Malay Language teachers for proofreading. This is to validate if the items have the same meaning when compared to the English version of the SILL – where the researcher uses as reference for analysis.

### 3.5.4 *Pilot Testing*

In the first phase of pilot testing, 20 students are selected from all over the school level. Each school level is represented by 2 male and 2 female students to ensure that the pilot tests' participants carry similar characteristics to the real samples of student population. This group of students is quarantined in the school's computer laboratory as they attain to

the translated inventory. Instructions are given out by the researcher as they browse through the questionnaires. Once they are done, the piloted instrument are collected and tested for its first reliability.

Revisions are made where the students find difficulty in comprehending or understanding certain statements in the questionnaires. For example, in Part A, Question 4: “...*gambaran jelas*...” – revised as “...*gambaran mental atau di pikiran*...” as in “...mental picture...”; in Part A, Question 5: “...*sajak berirama*...” – revised as “...*pantun berirama*...” as in “...rhymes...”; and in Part E, Question 42: “...*tegang dan ketakutan*...” – revised as “...*merasa tertekan dan risau*...” as in “...tense and nervous...”

In the second phase, the second draft of the questionnaires is ready to be pilot tested again. The same group of students is called back for the second pilot testing after an interval of two weeks. The pilot testing procedures are repeated before the collected instrument is tested for its second reliability test. No revisions are made further to the questionnaire to avoid unnecessary alteration and distortion to the original value in Oxford’s (1990) SILL inventory.

The reliability of this measure is then computed using the Chronbach’s alpha. The internal consistency of the SILL translated version using Cronbach's Alpha in both pilot tests as shown in Table 3. 3, indicates a high and acceptable reliability in both of the pilot tests.

**Table 3.7: Reliability of the SILL Questionnaires**

	<i>Pilot Test 1</i>	<i>Pilot Test 2</i>
Cronbach's alpha	.878	.835
Cronbach's alpha based on standardized items	.887	.837
<i>N</i> of items	50	50

Table 3.4 shows the internal consistency reliability of the translated SILL questionnaire in pilot test 2. It also summarizes the Cronbach's alpha coefficients of internal consistency for each category of the translated version. The Cronbach's alpha for each category and for the entire questionnaire ranges from 0.784 to 0.824: this indicates a good degree of reliability (Sekaran, 1992; McMillan & Schumacher, 2006).

**Table 3.8: Internal Consistency Reliability of the Translated SILL Questionnaire**

<i>Construct</i>	<i>Alpha Cronbach</i>	<i>N of Items</i>
Memory	.824	9
Cognitive	.802	14
Compensation	.815	6
Metacognition	.815	10
Affective	.810	6
Social	.784	6
Overall Items	.835	50

### **3.6 Data collection procedures**

Data collection procedures are subdivided into three systematic procedural stages – the pre-data collection, during data collection and post data collection.

#### *3.6.1 Pre-data Collection*

In the first stage, the researcher first makes arrangements and seeks approval from the school principal to administer the SILL test (Appendix D). A letter of consent (Appendix E) is also send out to the parents of the participants but there are no incentives given to the participants. The test will therefore, be administered a week after the final pilot testing.

#### *3.6.2 During Data Collection*

During the testing date, two English language teachers will help the researcher to administer the participants and test instrument. The participants will be grouped in the school hall according to their gender – the male on the left and the female students on the right side of the hall. They will also be seated according to their school level with the lowest form in the front row so that data is collected and arranged systematically from the lower forms to the upper forms. This also eases the researcher’s work during keying in the data results.

The students will also be advised not to discuss or talk to each other during the administration to avoid distractions and other extraneous variables that might affect the test results. They will also be told to answer the questionnaires honestly. Next, the

questionnaires will be distributed to the participants and necessary instructions will be given out to the participants pertaining to the SILL inventory.

### *3.6.3 Post Data Collection*

After explaining the instructions, the test will begin and be administered for 30 minutes. Once the test is complete, the researcher will debrief and thank the respondents for their participation, cooperation and time. The researcher will then report to the school principal that the test has been completed and thank him for the given opportunity. Finally, after completing the data gathered, the results will be examined and analyzed.

## **3.7 Framework for data analysis**

The framework of data analysis for this present study consists of six related components – the objective, question, hypothesis, sources and types of data and technique of analysis.

### *3.7.1 The Objective*

The ‘objective’ component states the four main objectives of the present study. Each specific objective matches each research question as stated in Chapter One.

### *3.7.2 Question*

There are four research questions that need to be analyzed in this study. Each question will be objectively analyzed using descriptive statistics, independent t-test or Mann-Whitney test if distribution is not normal, One-Way ANOVA or Kruskal Wallis test (non-parametric test) and Tukey’s Post Hoc test.

### 3.7.3 *The Sources of Data*

Data is sourced out from the SILL, a 50-items version applied for learners of English as a second language which is devised by Rebecca Oxford (1990) to assess the frequency of use of language learning strategies by students.

### 3.7.4 *The Types of Data*

There are two types of data involved in this present study. The first type of data is the interval data. Interval data is often used in psychological experiments that measure attributes along an arbitrary scale (Blaike, 2000) for example a Likert-scale ranging from 1 – 5, thus it gives out information on the quantity of the attributes. Quantitative information consists not only of numbers, but also of data that identifies what the numbers mean (Few, 2005). The *quantitative data* of the study are, therefore, the dependent variables such as the direct strategies (memory, cognitive, compensation) and indirect strategies (affective and social strategies).

However, to be complete and meaningful, quantitative information consists of both quantitative data – the numbers and *categorical data* – the labels that show what the numbers measure (Few, 2005). A set of data is said to be categorical if the values or observations belonging to it can be sorted according to category (Easton & McColl, 1997). As such, gender and the school level are categorical data as the characteristic of ‘gender’ is categorized as ‘male’ and ‘female’ whereas the ‘school level’ is categorized as the ‘upper forms’ and ‘lower forms’.

### 3.7.5 *Technique of Analysis*

Data collected from the questionnaire was analyzed using the Statistical Package for Social Science (SPSS) version 12. Data analysis techniques for the present study include the calculation of descriptive statistics, including means, standard deviations, and t-test. Significant variation in mean strategy use across the school level and gender is determined using a one-way Analysis of Variance (ANOVA) followed by a Tukey HSD (Honest Significant Difference) test.

#### (i) *Descriptive Statistics*

The quantitative data that is obtained from the SILL questionnaires are to be analyzed using the Statistical Package for the Social Sciences (SPSS) program to find means (M) and standard deviations (SD) of data of the language learning strategy, gender and school level. The mean indicates the frequency of language learning strategy use while the standard deviation indicates how widely the data is dispersed.

T-test is a statistical tool used to infer differences between small samples based on the mean and standard deviation, for example, the perceived use of language learning strategy between the male and female groups of secondary school students or between the male groups in upper or lower secondary school. In other words, it is used to determine the discrepancy of the data. The result is considered statistically significant when the data indicates the p-value is less than .05 ( $p < .05$ )



(ii) *One-way Analysis of Variance (ANOVA)*

One-factor ANOVA, also called one-way ANOVA is used when the study involves 3 or more levels of a single independent variable (Creech, 2003). Creech (2003) also states that the reason for doing an ANOVA is to see if there is any difference between groups on some variables. As an example, when looking into the language learning strategy perceived by the sample population in Form 1, 2, 3 (lower forms) and in Form 4 and 5 (upper forms).

The one-way ANOVA is also used as a statistical technique to test null or alternative hypothesis that several group populations' means are equal or otherwise (Choudhury, 2009). It has to be noted that one of the ANOVA requirements is that the assumption that all the groups have the same variance in the population. The word 'variance' is used because it examines the variability in the sample. Based on the variability or variance, it determines whether there is a reason to believe that the populations' means are the same or having different means. For instance, does the language learning strategy vary between the five groups (Form 1 – 5) of secondary school students? The other basic assumptions in ANOVA are the expected values of the errors are zero, the errors are independent and they are normally distributed.

Apart from that, ANOVA can also cope with two types of variances – Between Group Variance or the variability between group means and Within Group Variance or the variability of observations (or scores) within a group (around a particular group's mean). With that, F-ratio or F-test will have to compute using these two types of variances. The F-test or the F-ratio is a measure of how different the means are relative

to the variability or variance with each sample. The larger the F value, the greater the likelihood that the differences between means are due to something other than chance alone.

(iii) *Tukey's Honestly Significant Difference Test*

Lowry (1999 – 2010) states that a Tukey HSD post-hoc test is needed after completing the ANOVA F-test in order to determine which groups differ from each other. However, he explains the test cannot be conducted unless there is an effect (rejected the null) found in the ANOVA problem. Otherwise, if the null fails to be rejected, then there are no differences to find.

For the Tukey's post-hoc test, Abdi and Williams (2010) explain that the differences between the means of all of the groups have to be obtained first. They explain further that a comparison for the difference score to a critical value is done to see if the difference is significant. In plain words, they stated that the 'critical value' in this case is the HSD (honestly significant difference) and it must be computed because it is the point when a mean difference becomes honestly significantly different.

All in a nutshell, Figure 3.1 presents a summary of the analytical framework which is the core methodological element for this chapter.

No.	Objective	Question	Sources of Data	Types of Data	Technique of Analysis
1	To investigate if there is any significant difference in the types of language learning strategy use among the upper secondary male students.	Is there a significant difference in the types of language learning strategy use among the upper secondary male students?	SILL questionnaires (Oxford. 1990)	Interval & categorical	Descriptive statistics (mean, standard deviation)  Independent t-test or non-parametric: Mann-Whitney test
2	To find out if there is any significant difference in the types of language learning strategy use among the upper secondary female students.	Is there a significant difference in the types of language learning strategy use among the upper secondary female students?	SILL questionnaires (Oxford. 1990)	Interval & categorical	Descriptive statistics (mean, standard deviation)  Independent t-test or Non-parametric: Mann-Whitney test
3	To find out if there is any significant difference in the types of language learning strategy use among the lower	Is there a significant difference in the types of language learning strategy use among the lower secondary male	SILL questionnaires (Oxford. 1990)	Interval & categorical	Descriptive statistics (mean, standard deviation)  One-way ANOVA or Kruskal Wallis test

**Figure 3.1: Summary of Analytical Framework**

No.	Objective	Question	Sources of Data	Types of Data	Technique of Analysis
	secondary male students	male students?			Tukey's HSD
4	To determine whether there is any significant difference in the types of language learning strategy use among the lower secondary female students.	Is there a significant difference in the types of language learning strategy use among the lower secondary female students?	SILL questionnaires (Oxford. 1990)	Interval & categorical	Descriptive statistics (mean, standard deviation) One-way ANOVA or Kruskal Wallis test Tukey's HSD

**Figure 3.1: Summary of Analytical Framework (cont'd)**

## **Summary**

This chapter has described the specific processes that were used to conduct the research in this study. The study used a stratified sampled population – the upper and lower secondary school students in a suburban area, to determine the differences in the perceived use of language learning strategy in regard to the students' gender and school level. The Strategy Inventory for Language Learning (SILL) version 7 which requires students to answer questions on their language learning strategy use on a five-point Likert scale ranging from "never or almost never true" to "always or almost always true" was used to assess the perceived use of language learning strategy among the secondary school students. The methodological process work of subjects' selection, the setting, the sampling method usage, data collection procedures and analysis as well as the techniques involved in the analysis were framed out in the research design of the study and explained thoroughly in the framework for data analysis. The data, thus, will be analyzed and discussed in Chapter 4.