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# Pupils' Difficulties in Writing on Scientific Topics:

### *The Case of Third Year Ain Merane Secondary School Pupils, Chlef*

A Dissertation Submitted in Partial Fulfillment of the Requirement

for the Degree of Magister in ESP

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# Dedication

I dedicate this work to my parents, my wife and my little child Mohamed Heithem.

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# Abstract

No one can deny the fact that writing is not an easy task, and dealing with scientific topics makes it more difficult. The reality shows that the "terminal" pupil is unable to write meaningful coherent paragraphs and essays on scientific subjects. Certainly, there are some factors which refrain pupils from expressing their ideas freely and easily in a written form. In this respect, the primary purpose of the present work is to reveal the reasons behind the pupils' difficulties in writing on scientific topics.

Working with thirty secondary school pupils and ten teachers by submitting questionnaires and a writing test, the findings indicate that "terminal" pupils fail to write successfully on scientific matters due to the following reasons: The lack of motivation and self confidence of both teachers and pupils, the need to master the different mechanics of language like grammar, spelling and punctuation, the teacher's role which is not motivating and the lack of the necessary scientific knowledge to generate ideas about scientific subjects.

The present thesis consists of four chapters: The first one deals with the methodology design and the learning situation where much discussion is devoted to tackle the situation of teaching English in Algeria and the different writing tasks assigned for secondary school pupils. It also exposes the major pupils' deficiencies in writing. The second chapter reviews the related literature into two main parts; the first one is concerned with describing writing and all that may have a relationship with the writing pedagogy. The second one deals with science writing, its characteristics and the different mechanics of language needed for efficient writing on scientific issuers. The third chapter deals with the analysis and interpretation of the tools used in the investigation starting by devoting two questionnaires, one for pupils and one for teachers, and ending with a writing test for pupils to reveal their deficiencies in writing about science. The last chapter is devoted to suggest some solutions and recommendations to overcome the problem.

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# List of Abbreviations and Acronyms

**BAC**:          Baccalaureate

**BEM**:         Brevét d'enseignement fondamentale

**CBA**:         Competency-based approach

**ESP**:         English for specific purposes

**EST**:         English for science and technology

**GE**         General English

**L1-**         First Language

**PPP Model**    Presentation practice production model

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**General Introduction**

Writing is an art; it is the act of transforming thoughts and ideas into written words. It is a form of expression and communication through which learners communicate ideas and express different attitudes in a written mode. However, learning how to write is not an easy matter, especially when asking learners to deal with scientific topics because writing in the ESP (English for Specific Purposes) context poses more difficulties for the foreign-language learner who has to master the content vocabulary as well as use it in a meaningful context relying on specialized content, terminology and conventions. Writing then requires much efforts and enough competence to produce correct meaningful sentences in coherent paragraphs in well-structured essays. Therefore, it is considered as a complex skill to master even for natives.

In fact, the act of writing is acquired through practice and thanks to an effective learning process. Any failure in the process of writing is, undoubtedly, due to a whole host of reasons and interrelated factors that make learners unable to express themselves freely and correctly whenever they want. This is, indeed, the concern of the present work. Thus, the main purpose of this study is to reveal the major difficulties that secondary school pupils encounter when engaged in writing on scientific topics, and to expose their real needs in science essay production. To conduct an investigation in this subject four questions are asked:

**1**-Why do our pupils produce poor written performances on scientific topics?

**2**- Why is it difficult for terminal pupils to write on scientific topics?

**3**- What should be done to overcome this problem?

**4**- How to teach writing on scientific matters efficiently?

To answer these questions, one could raise the following hypotheses:

**1-** The pupils' difficulty in writing on scientific topics is probably because of the lack of scientific knowledge; that's to say, learners do not have the sufficient scientific culture to write on this kind of topics.

**2-** It may be due to the role of teachers who do not motivate learners to deal with scientific matters.

**3-** The deficiency may lie in the pupils' difficulty in the different aspects of language- the lack of scientific vocabulary, the misuse of grammatical rules in writing, as well as other writing concerns.

**4-** The problem could be in the learners' fear of treating scientific matters with a lack of motivation and self-confidence.

**5**- To solve the problem, teachers should motivate learners and apply efficient strategies in teaching writing on scientific topics.

To test the above hypotheses three research tools were used to collect data: two questionnaires and a writing test. One questionnaire was submitted to a group of third year secondary school pupils, scientific stream whereas the other one was addressed to teachers who were supposed to know more about their pupils' deficiencies in writing. Finally, a writing test was submitted to pupils in order to reveal their real needs in dealing with scientific topics in writing. These three significant tools serve to investigate the main causes behind the pupils' reluctance in writing on such matters.

This research consists of four main chapters. The first chapter deals with the learning situation in which the research methodology design is well determined and the learning context is well explained. In this stage of study, the research work sheds light on the main difficulties that learners face when writing on purely scientific subjects.

The second chapter is dedicated to the literature review where the researcher describes the different approaches and the most effective strategies of teaching writing for secondary school pupils. He also presents the different

types of writing and shows the major features and characteristics of teaching writing on science.

The third chapter, which is purely analytical, is concerned with the treatment and analysis of obtained data. Indeed, each tool paves the way to the next one so as to ensure a careful treatment of the gathered data and a wise analysis of all the results. By the end of this chapter, all the findings will have been analyzed and treated objectively in order to find concrete solutions to the problem.

Speaking about solutions opens the gate of the last chapter where the researcher attempts at suggesting some convenient solutions and proposing a remedial work to motivate learners in writing. Besides, some effective strategies will be discussed on how to overcome possible shortcomings in grammar, vocabulary, spelling, style and the suitable way to generate ideas about scientific subjects.

# Chapter One

# Learning Situation

## 1.1- Introduction

Teaching writing is not an easy task because it requires enough knowledge of efficient strategies and practical techniques from the part of teachers who need sufficient training to give satisfactory results. The matter becomes more difficult when teaching pupils how to deal with scientific topics in their writings.

This introductory chapter aims at shedding light on many aspects of this investigation. Thus, it is very necessary to expose the research methodology applied in this research referring to the appropriate method chosen for conducting this study as well as describing the population under experiment and the convenient tools for data collection.

To describe the setting where the study takes place, the researcher tackles the educational system in Algeria and moves to depict the way English is taught in schools for different levels focusing on secondary scientific stream pupils. Then, the reforms undertaken by the ministry of education necessitate referring to the Competency-based Approach which is applied in the teaching field. The objective from shedding light on this approach is to show how the writing skill is taught in our secondary schools. After that, the researcher mentions the precise roles of both teachers and learners in the classroom. Thus, it is an opportunity to explain the teaching and the learning strategies implemented in the field taking into account the writing skill.

To reveal the pupils' writing tasks, the researcher explains the different writing assignments either inside or outside the classroom and the objectives set for these writing tasks. This is directly followed by evaluation through which learners are tested and evaluated in exams to know their real progress in writing.

The last section of this chapter is devoted to discuss some of the major difficulties that secondary school pupils encounter when writing on scientific topics.

**1.2- Research Methodology Design**

Whatever the objectives set for a research, it can not be authentic and evaluable if it does not respect a well-organized methodology which relies on certain precise pedagogical and linguistic principles. To put this reality into practice, this work is based on three main elements which are: the choice of the method, population and sampling and data gathering tools .All of these elements serve to better understand the third year secondary school pupils' difficulties in writing successful science essays.

**1.2.1-The Choice of the Method**

The choice of the appropriate method for any kind of research depends largely on many factors such as: the nature of the problem, the type of the needed data, the objective of the research work and the population.( Turney and Robb, 1971).

Taking into consideration all these factors, the present work aims at describing a situation and carrying out an experiment i.e., it is based on a combination of descriptive and experimental approach which fits the purpose of this research. It is descriptive in the sense that it seeks describing the writing skill and stating the major facts related to the way our learners deal with scientific topics in writing. It is experimental in the sense that it relies on testing the gathered data and confirming or disconfirming the findings of the study. Thus, the choice of this method certainly helps to clarify the main reasons of the pupils' difficulties in writing on scientific subjects.

**1.2.2-Population and Sampling**

One of the main difficulties that our pupils face during their learning process is the ability to write .The problem becomes more difficult for the secondary school pupils while dealing with scientific topics.

To shed light on this educational issue, the present work relies on a group of thirty 3AS pupils who have a beginner intermediate level and an average

age of eighteen years old. They live in a small town located in Ain Mrane and study in Belhadj Abdelhadi Charef Secondary School (wilaya of Chlef).These pupils are gathered, tested and questioned about their writing situation during their learning process so as to reveal the reasons behind their inability, reluctance, and fear from dealing with scientific matters in writing.

It should be noted that the learners chosen for this investigation are of different levels in English (brilliant, average and weak pupils).All of them belong to the same scientific stream class.

At the same time and for the sake of being more objective in this investigation, another group of ten secondary school teachers are questioned about their learners' writing situation in tackling scientific matters. Their views are taken into account because they are the first to be aware of the pupils' needs in learning language and know more about the way to solve the problem. Here, one should point out that the ten (10) teachers in this investigation live in the same region where the pupils live (Ain Mrane) and five of them teach in the same school of the investigated sample of pupils.

### 1.2.3- Data Gathering Tools

Any scientific research is based on a number of tools to achieve the intended objectives. For this study which aims at clarifying the real reasons behind the pupils' difficulties in writing on scientific topics, three main tools of research are relied on. First, the most convenient tool that suits the objective of this research and the most effective way of gathering data from informants is submitting questionnaires for the informants; one for pupils and one for teachers. Second, relying only on questionnaires to get information from the population is not sufficient .That's why preparing a writing test for the pupils to come upon their shortcomings and the difficulties they encounter when engaged in writing on scientific topics is more than a necessity.

**1.3 The Educational System in Algeria**

Education in Algeria is free and officially compulsory for Algerians aged between 6 and 15. Recent figures show an average of 97% of boys and 91% of girls attending school, the reason why the current literacy rate is estimated to be around 70%.Education consumes one-quarter of the national budget. The primary language of school instruction is Arabic, but Berber language instruction has been permitted since 2003. French is taught as a first foreign language whereas English is considered as a second foreign language. After the French ten year compulsory school model, then the foundation school ( Ecole fondamentale et polytechnique), Algeria adopted another new system of education structured as follow: primary school, middle school, secondary school and university.

| Levels | Age |
|---|---|
| Kindergarten | 3-5 |
| Primary school | 6-10 |
| Middle school | 11-14 |
| Secondary school | 15-17 |
| University | ≥18 |

*Table 1.1: The Educational Structure in Algeria.*

Primary education starts at the age of 6 and lasts five years. Although some children are lucky to attend kindergartens before this age, most of them, particularly those in rural regions, can not receive this basic form of education.

In middle school, pupils have to spend four years and finish this stage by taking a final examination called BEF to be admitted in the secondary school or oriented toward vocational training.

Generally, secondary education begins at the age of 15 and finishes when pupils take the Baccalaureate Examination which determines the pupils path;

either to university or vocational training centre. At this level of education, pupils are oriented toward a wide range of streams such as: literary, scientific, foreign languages, mathematics or other technical streams.

To be admitted at the university, pupils are required to get their Baccalaureate Certificate with a least general average equal to 10/20.

## 1.4 Teaching English in the Algerian Secondary School

Algeria has given great importance to the foreign languages, especially English which has become the language of politics and economics. The need to establish many political and economical relations with different parts of the world has urged Algeria to encourage teaching English in the early stages of its educational system starting from the middle school with three hours a week.

In the secondary school level which is our concern in this research, English is taught to all the streams (Foreign languages, literature and philosophy, science and biology, Mathematics and other technical streams) from first year to third year but with different timing and coefficients.

In the first year level, English is nearly taught similarly for both scientific and literary streams which have almost the same syllabus to be applied .However, pupils of literary stream learn English for four hours a week whereas those of scientific stream have only three hours a week of learning the language.

In the second year level, a kind of teaching English for specific purposes ( ESP) starts to take place in the field of teaching process due to the different syllabi designed for the different streams. If we take the case of the scientific stream, teaching English has much to deal with scientific subjects and notions that learners are acquiring in every day learning situation. Thus, a major focus is on teaching scientific vocabulary, scientific discourse and dealing with scientific topics in a purely scientific style.

In the third year level, the objective from teaching English in relation with the pupils' branch (scientific or literary stream) seems to be more emphasized since there is a noticeable difference in the programme designed for each stream. The table below illustrates the programme of English for third year secondary school level.

| Unit | Scientific stream | Literary stream |
|------|-------------------|-----------------|
| One | Ethics in business | Ancient civilizations |
| two | Food safety, advertising and economy | Ethics in business |
| three | The solar system | Education in the world |
| four | Feelings and emotions | Feelings and emotions |

*Table 1.2: The Third Year English Programme for Scientific and Literary Streams.*

## 1.5-Competency-based Approach and Teaching Writing for Secondary School Pupils

The Algerian educational system has recently adopted a new approach in the field of teaching called "Competency-based Approach". The latter came in an attempt to bridge the gap between school life and real life, by relating school acquisitions to every day situations inside as well as outside school. It is based on three main principles such as: competence, problem-situation, and transfer of knowledge.

### 1.5.1- Competence

According to the Oxford Advanced Learner's Dictionary, competence is defined as the ability to do something well or it is the skill which is needed for a particular job or a given task. Indeed, it is a notion which is borrowed from the language of markets, investments and products.

For Gentile and Bencini (2002), competence refers to the faculty of mobilizing a set of cognitive resources such as knowledge, capacities,

and information, to face with efficacy and pertinence a family of situations. Not far from this context, Perrenoud (2001) gives an example about examining a sick child. He thinks that competence in this situation does not only mean mobilizing capacities such as taking the temperature, knowing how to observe the psychological signs and how to cure the illness but the real competence requires knowledge of pathologies and their symptoms, emergency measures, medicines and some pharmaceutical services.

In schools, Perrenoud (2001) asks teachers to establish competencies in their learners through providing them with appropriate learning conditions. For him, learners should face different learning situations which require the mobilization of school acquisition. Here learners are supposed to encounter a wide range of tasks to achieve like solving language problems, taking a decision, conceiving a project, etc…

On the whole, there are four key elements that should be retained when speaking about competence: knowledge, skill, capacity, and attitude

Knowledge according to Greene (1987):

> *"refers to all the information we have stored in memory, including common sense knowledge. It can be thought of as a record of past experiences, knowledge of facts and know-how about what to do and when"* .

Skill as noted by Sullivan (1995) is:
> *"a task or group of tasks performed to a specific level of competence or proficiency which of ten use motor functions and typically require the manipulation of instrument and equipment."*

Capacity in Support Document for the Competency-based Approach is:

> *"a know- how, adequate acting which allows someone to take up a role, a position or activity"*

An attitude is identified by Support Document of the Competency-based Approach as :

> *"a relatively stable and sustainable integration of certain values which facilitate certain behaviours. It is not directly*

*observable, but can be inferred from the observation of behaviours"* .

To end with, because there is no exact common definition of competence, it is a concept subject to controversies.

## 1.5.2- Problem –Situation

From its name one can conceive its meaning which refers to an obstacle or a problem that needs solving. In schools, the advocates of the Competency-based Approach as teachers to expose their learners to different language problems and let them find solutions instead of providing them with information and knowledge. Like this, learners acquire a new knowledge to face language problems.

In describing problem-situation , Perrenoud (2001) states that a problem-situation  is centered on an obstacle  to overcome through  hypothesis generation,  the obstacle  to overcome needs  to be challenging but not insurmountable. He views that in the problem-situation pedagogy; it is question of soliciting learners in their Zone of Proximal Development. The latter means the conceptual distance between what  learners can  do  on  their own,  and  what they can  do  with  assistance of  more competent adults or peers .

## 1.5.3- Transfer of Knowledge

Transfer of knowledge is based on two main elements such as past learning and present learning. The effect of using the acquired past learning in new learning situations is one of the major objectives of Competency- based Approach. So, any successful learning process to CBA is measured by how well teachers motivate learners to use their previous knowledge and information in new real life situations. However, it  is  not  because  students do well  on  tests  that  their  teachers  can ensure that they can transfer to real life contexts what they have learned.

In order to achieve an effective transfer of knowledge, learners should be taught about how to use their skills and information to solve any language problem and apply much of what they have already learnt at school in new learning contexts. Therefore, the transfer of knowledge depends largely on how well the skills or information were previously learnt and how similar is the new situation to the situations where learners have acquired the knowledge. In writing, the transfer of knowledge happens when learners succeed to apply what they have learnt before in case of grammar, vocabulary, punctuation, cohesion and coherence in new writing situations.

## 1.6- Role of the Teacher and Teaching Strategies

Competency-based Approach reduces the authoritative role of the teacher who has no longer been the knowledge holder. His duty is no more than guiding, controlling and encouraging pupils to take part and find solutions to their own problems. He is responsible for creating a climate in which learners succeed to develop efficient strategies in acquiring the second foreign language. His role under the Competency - based approach is no more just a transmitter of knowledge but rather a facilitator who motivates learners to engage in tasks, and helps them to work in collaboration through pair and group work. He is responsible for ensuring individual teaching, if necessary, for his pupils who may not have equal mental abilities.

According to the Accompaniment Document of English Programme of The Third Year Secondary Level, May 2006, secondary school teachers can achieve all that has been said so far by:
- Working regularly by situations-problems.
- Negotiating and leading projects with their students.
- Considering knowledge as resources to mobilize.
- Ranging of educational opportunities.
- Practising formative evaluation in work situation.
- Working collaboratively with colleagues in other disciplines.

At the level of providing appropriate teaching strategies, teachers help pupils to build their own knowledge and find solutions to their learning problems (the intervention of the teacher may be minimal or emphasized, this depending on the degree of difficulty of the problem situation).Here, one should note that teachers are not only supposed to help learners to use strategies to get information but also evaluate the use of these strategies by giving convenient ways of readjusting its use. Therefore, the teacher's role is to make knowledge accessible to learners through explanation. In fact, the latter does not only mean transmitting knowledge to learners via teachers but also the pupils' active involvement in processing the information.

Generally speaking, teachers should guide their pupils in their learning by giving clues, reminders and reducing their total autonomy so as to let learners choose their own learning appropriate strategy and meet their needs in acquiring language. This is for the teacher's role, what about the learner's one?

**1.7- Role of the Pupil and Learning Strategies**

To learn means to acquire knowledge and especially to develop the cognitive structure of the learner. The new teaching approach (Competency Based Approach) is based on the belief that the learner is responsible for his learning through building his own learning strategies and working more independently. He does not only increase his intellectual potential and improve his process of memorization but he also assesses his learning and finds solutions to his language problems.

According to the Accompaniment Document of English Programme of The Third Year Secondary Level, May 2006, the learning strategies can be classified into three main categories such as:

1- Cognitive strategies (to repeat, to consolidate, to deduct, to discuss etc.)

2- Met cognitive strategies (to organize, to plan, to assess etc.)

3- The strategies of resource management (the Organization of the time - effort management, the Organization of the study environment)

Pupils should have positive attitudes towards learning how to write. They are responsible for their own learning. For Jeremy Harmer (2001) learners who react positively towards learning a language and the culture of its natives are likely to achieve more successful learning than others. Although teachers play a major role in motivating their pupils to learn a language, they can not achieve this objective if their learners do not make efforts, for example, in doing their written exercises, acquiring vocabulary, practising some grammatical structures and doing their home works.

Pupils should be ready at all time to take risks and write about different situations so as to develop their mechanism of writing and get rid of anxiety and fear from expressing their ideas and thoughts in a written mode. They have to ask for a help from their teachers whenever they feel they need assistance. It is through asking questions that they can overcome ambiguity and confusion. They should also bear in mind that making mistakes is unavoidable .On the contrary, they should learn from making mistakes and they have to accept correction whether from the teacher or their peers. These are, indeed, some good learning qualities that learners should take into account if they really want to develop their learning process and effective writing habits.

## 1.8 – Third Year Secondary School Pupils' Writing Assignments

Before describing the different writing assignments that pupils are asked to do during their learning process, it is more than important to shed light on the English syllabus for the third year secondary level which is laid out by the National Curriculum Committee of the Ministry of National Education in March 2006.

With regard to the overall approach applied in teaching, it is the competency- based, learner-centred and project-geared through which all the streams are expected to cover four different units of the six recommended themes in the syllabus with recurrent language functions, grammatical structures and language components as well as skills and strategies. Every unit comprises four sequences: Listen and consider, Read and consider Listening and speaking and Reading and writing. In this respect, one should note that these four sequences are always followed by other additional rubrics entitled Research and Report and Project outcomes in which pupils are assigned to prepare a project at the end of each unit of the syllabus.

As far as the writing skill is concerned, "terminal pupils" are asked to do many different writing tasks which are related to the themes of the input covered in the programme. At the end of each sequence, pupils are required to write about a subject that concerns the whole objective of the unit. Here, learners are usually needed to use one of the types of writing they have already seen during the previous sequences. Therefore, knowing about the characteristics of the different types of writing (expository, argumentative, narrative and descriptive) is very crucial to engage in any successful writing task.

The first writing task is always done in the opening sequence of each unit of the syllabus where learners have to prepare short talks, policy statements, and speeches during the rubric of Think, Pair, Share. In the second sequence, learners are expected to engage in real writing production where they are asked to write essays of different types, opinion articles, full letters, and newspaper articles about the themes designed for the concerned units. The third and the fourth sequences are always closed by Saying it in writing and Writing development rubrics where learners are asked to do different writing assignments in order to prepare themselves for the project of the whole unit.

Since this investigation deals with writing on scientific topics in particular, teachers who teach scientific streams are required to put so much focus on the characteristics of the scientific themes they are concerned with in case of style, vocabulary, spelling and the scientific knowledge they transmit to their learners.

## 1.9-Testing Pupils' Abilities in Writing

Tests and exams are very necessary to evaluate any development in the learning process because they can give teachers an idea about how and where learners are at the moment. They can also give pupils information about what they know. In the case of third year secondary school level, pupils are tested for a wide range of reasons; here are the most important ones:

**1**- To diagnose the learners' strengths and weaknesses in writing.

**2**- To come upon the real level of the pupils' knowledge in acquiring the language.

**3** - To measure the learners' achievement in writing.

**4 -** To enable teachers to decide what to teach next.

**5**-T o motivate pupils to learn or review specific material.

**6**- To evaluate the effectiveness of instruction.

Pupils are tested in their writings every trimester to evaluate their development in writing the English language and come upon their shortcomings in their written products. In both tests and exams, they are asked to do many writing tasks which differ according to objective, time and input. On the whole, in written expression section, pupils are required to choose between doing two types of writing exams; either writing about a guided topic or a free one.

With regard to guided writing, learners are free to choose their lexis and grammar but write within a framework. The latter will prevent learners from trying to write at a level that exceeds their state of knowledge (Rivers 250). Here, pupils are neither strictly controlled nor totally free. Among the

guided activities that they may be asked to do are: summarizing a text, paraphrasing a statement or using cues to write about a given topic.

Concerning free writing, the matter seems to be a bit more difficult since pupils need a lot of help before they start writing their compositions. After selecting a topic for written production, learners are required to rely on themselves in generating ideas and using the appropriate lexis and the right grammatical structures to write about the topic. Although the free writing could be done at home, learners still need more assistance from their teachers to produce coherent meaningful essays.

As far as secondary school Pupils of the scientific stream are concerned, they are mostly asked to write about topics related to scientific issues which have been dealt with throughout their learning programme. The followings are examples of two different topics that pupils may be asked to write about in a written expression session.

**Topic 01** (guided topic): Using the information provided in the table below, write an essay comparing and contrasting the two presented planets.

| planets | Moon | Rings | Rotation period | Atmosphere components | Diameter (km) | Distance from the sun (millionkm) |
|---------|------|-------|-----------------|-----------------------|---------------|-----------------------------------|
| **Jupiter** | 16 | 01 | 11,86years | Hydrogen Helium | 143,200 | 778,3 |
| **Earth** | 01 | 00 | 365,3 days | Nitrogen Oxygen | 12,756 | 149,6 |

*Table 1.3: Using Information to Write an Essay*

**Topic 02** (free topic): Do you think that astronomy is a useful science? Explain by giving three arguments and facts.

After doing the test or exam, teachers correct their pupils written products relying on marking scales. For the scientific stream, teachers give 05 points out of 20 for written expression; 02, 5 for content and 02, 5 for form.

## 1.10 -Third Year Secondary School Pupils and Science Essay Writing Difficulties

Writing is not an easy task because it consists of many aspects of language such as:

> *Punctuation, cohesive devices, organization, skills, spelling, vocabulary, grammar and syntax* (Raimes, 1983).

That's why it is said that writing is the most difficult skill in language learning. (Ortega, 2004). The difficulty as (Kroll) 1990 and Myles (2002) think does not only lie in how to formulate and organize ideas, but in how to transform them into written products.

In practice, and as far as this research is concerned, secondary school pupils find it more difficult to write on specific scientific topics. In support of this reality Cozens, (2006) says:

> "*Writing in various academic disciplines, such as Science or Medicine, is even more complex*".

In deed, pupils are unable to tackle scientific topics due the difficulty of generating ideas about this kind of subjects. However, the lack of ideas does not only seem to be the unique reason of this handicap, there are other factors which make the situation more and more complicated. In this respect, Al-Seghayar (1998) discovered that English is not immediately relevant to the Arab students' needs in high schools and universities. They do not consider learning the language a priority. Primarily, their efforts are devoted to acquiring that level necessary to proceed to the next level, writing is only learnt in order to pass exams. So, it is obvious that the pupils' attitude towards learning English in general and developing the act of writing in particular is not so motivated. Besides, the difficulty of using the scientific vocabulary

items appropriately and the problem of applying grammar in writing make learners incapable of dealing with scientific topics successfully. Let alone the difficulty of spelling accuracy and the use of the right connectives to ensure coherent and cohesive paragraphs .All these factors are concrete obstacles which refrain pupils from writing on scientific matters. This will be tackled in details in the following section of study.

**1.10.1- Lack of Scientific Knowledge (Ideas)**

It is said that writing without effort leads to reading without pleasure*.* In the light of this statement, one can conceive the importance of ideas in writing. However, the fact of generating ideas and transforming them into written form is not an easy task. The teaching field indicates that:

> *"Arab learners find composing in English difficult because the writing process requires them to conceptualize"* (Myles, 2002).

Most of the secondary school English teachers state that their pupils are unable to brainstorm and generate ideas independently; they always need guidance from their teachers. In the same context J.Harmer (2007) claims:

> *"...even the most fluent writers in their own language need time to generate ideas and to plan what they are going to write. Students are no different".*

Another reason for the pupils' lack of ideas is the inability to think in English since it is their foreign language. Thus, some of them resort to translation from their mother tongue to the target language. However, translation does not often solve the problem as it sometimes leads to confusion and ambiguity. In support of this, Khuwaileh (1995) found that Arab students usually think and prepare their ideas in Arabic and then translate into English. Thus, there is a sort of negative transfer which can result in unsatisfactorily written samples. Some words are not easily transferable.

Gross*,* (2000) mention that another reason for students'lack of ideas is because they suffer from traditional classroom approaches where questioning

teachers and forming individual opinions are strongly discouraged. The influence of tradition and culture also discourages them from questioning their teachers and voices of authority brainstorming may reduce teacher dominance in the classroom and lead to independent learning that could motivate students to write more freely without guidance from teachers.

**1.10.2 – Problem with Vocabulary**

Using the appropriate vocabulary items in writing is one of the major difficulties that face secondary school pupils in learning English, particularly when they are asked to deal with scientific vocabulary terms. (Al-Mutawa and Al-Kailani 1998) claim that learning vocabulary is a complex process which demands efficient practice of form, meaning and usage. In the same context Doushaq (1986) notes that Arab learners encounter difficulties in dealing with the appropriaty of lexis, wordiness and redundancy. According to (Ryan, 2005)It is a complex process because it requires seeing the word, spelling, meaning, pronunciation, grammatical status and appropriate register and what the word collocates with. The difficulty of using the appropriate vocabulary which suits the different situations that learners are asked to write about is a great problem for secondary school pupils. In support of this reality, Rabab`ah (2005) pointed out that the students often lack the necessary vocabulary when they are engaged in authentic communicative situations such as writing and speaking. As a result, the students will be unable to express their ideas freely and accurately because of their limited vocabulary.

In the Algerian  context, secondary school pupils learn both general and scientific vocabulary, but teaching scientific vocabulary and concepts pose challenges to teachers who are most of the time less competent in comprehending the subject's terminology. So, the problem of vocabulary does not only affect pupils but teachers are also concerned.

### 1.10.3 - Difficulty in Spelling Accuracy

Using wrong spelling is another serious problem that secondary school pupils face when they are engaged in writing tasks. The difficulty lies in the difference between the irregular spelling system of English and the regular phonetic script of Arabic (Kharma and Hajjaj 1997).For instance, it is not easy for many secondary pupils to distinguish between letters like s and c in spelling (i.e. "sight" and "cite") or between words like "where "and" "were". They have also problems with silent letters like the final –*e as in care, bite,* the –h in question words like *what, why* and the –*gh* in words such as *night, taught.* Problems may also concern homophones where two words sound alike but are spelled differently as in the case of "no" and "know".

To explain the origin of most of these difficulties, Ibrahim (1978) stated that the majority of errors were caused by the differences between the sound systems of English and Arabic. He also noted errors attributable to the somewhat inconsistent spelling in English word derivation such as high/ height and speak/ speech.

At the end, one should assert that the problem of spelling in writing is a persistent problem which may concern even professional writers, journalists or academics.

### 1.10.4 - Difficulty in Applying Grammatical Rules in Writing

The reality shows that secondary school pupils face difficulties in grammar which is extremely important in conveying accurate messages. They fail to apply grammatical rules correctly in their writings. According to (Dudley-Evans & St. John, 1998) Key grammatical forms include tenses, voices, modals, articles, nominalization, and logical connectors. In this respect (Hinkel, 2002) criticizes the traditional approaches of teaching grammar which focus on inflectional forms of English verb tenses with the teacher's explanations of the forms. He also thinks that contextualizing grammar and

raising learners' awareness of how language is used in every day situations is an efficient way of teaching grammar.

Generally speaking, like other writing problems, grammatical errors are a result of inadequate learning and poor teaching. (Richards, 2001) calls these errors intralingual and developmental errors. The first type represents the general characteristics of the rule learning, faulty generalization, incomplete application of rules and failure to learn conditions under which rules apply whereas the second type refers to the learner's attempt to try to build up hypotheses about the target language from his limited knowledge learnt in schools or naturally acquired.

According to Ryan (2005), the formality of the education system of Arabic speaking learners of English consists of traditional drills and structured written exercises. Students have to imitate forms of writing instead of writing freely and creatively. To solve the problem, the students' needs could be met by a course which develops the knowledge of how sentences are combined together to make meanings.

Most of the grammatical problems in the secondary school pupils' writings arise in verb formation, tense and subject-verb agreement.( . Kambal, 1980).He noted that the learners problems can be summarized in the from disagreement between verb and subject, irregular past tense forms, cohesion, sentence construction and lack of paragraph unity.

## 1.10.5 - Problem with Capitalization, Punctuation and Sentence Linkers

It is commonly known that the role of using capital letters is to signify the beginning of a sentence, denote a proper noun, and a title (such as rank, status, book, play, poem, etc.However, in practice ,  the misuse of capital letters in writing is the most common problem for learners. This can be seen through the secondary school pupils' written production where they use small letters at the beginning of new paragraphs and capital letters in the middle of

sentences. In this respect, (Al-Nafisah, 2001) noted that the absence of capital letters in Arabic writing is a problem for Arab learners to write English.

With regard to punctuation which is more than important in understanding any piece of writing, many studies and researches show that foreign language learners do not know how to use the punctuation marks correctly in conveying information accurately and effectively, the reason why they fail to convey their intended meanings appropriately. This reduces not only understanding but also accuracy.

Practically, pupils do not appreciate the use of full stop, comma and semi-colon. Let alone the use of the other less frequent punctuation marks. As a result, coherence seems to be absent in their writings.

Concerning the use of the right connectors to link between different language speech parts in well-cohesive written products, it is another handicap of the secondary school learners. Even when (Crewe, 1990) states that the misuse of logical connectives is an almost universal feature of ESL writers, certainly foreign language learners are also affected by this problem.

To argue the reasons of this difficulty,( Kharma and Hajjaj ,1997) noted that Arab grammarians do not distinguish between coordination and subordination in the same way as English . This may cause difficulty for Arab students when dealing with subordinate clauses in particular.

## 1.10.6 - Difficulty in Writing Coherent Paragraphs

Writing well-organized and coherent paragraphs is one of the most difficult tasks for pupils. In this context *(Doushaq, 1986; Hill, 1986)* stated that Paragraph development was also one of the main concerns that impede Arab learners' ability to write well in the target language. It is not easy for learners to do that because:

> *"the English concept of paragraphing does not exist in Arabic writing"* (Al-Magableh, 1997; Fageeh, 2003).

That's why Arab learners are influenced by their mother tongue (Arabic) where the aural tradition of Arabic prose differs from the visual orientation of English prose i.e., In Arabic , learners are not trained to develop their ideas in coherent paragraphs. To argue this point, Doushaq (1986) noted that the Arab learners received inadequate instruction in organizing a coherent paragraph.

In school, the reality shows that pupils are unable to produce coherent paragraphs. They rather ignore how to structure their essays in well-organized paragraphs because they don't know how and why they should write in paragraphs. So, the lack of knowledge let pupils write randomly focusing on expressing ideas and forgetting about the way of how to present these ideas.

## 1.11– Conclusion

The first chapter is regarded as a key to open this investigation which aims at revealing the pupils' difficulties in writing on scientific subjects. It is, indeed, a starting point to all that may have a relationship with the present work.

First of all, it is very crucial to expose the methodology followed in this work by referring to the chosen sample of pupils under experiment and the different tools used to obtain the findings of the study. Then, speaking about the Algerian Educational System is very useful to explain how education is viewed in our country through tackling its different stages and the characteristics of each stage. After that, the researcher depicts the situation of teaching English in secondary school and presents a vivid picture about the application of the Competency-based Approach in the teaching field.

Teachers and learners are also important elements in this discussion since they have to play their roles in learning teaching processes. Here, pupils are needed to engage in a wide range of writing tasks which are evaluated through tests and exams.

Finally and before closing this chapter, the researcher deals with the pupils' deficiencies in the different mechanics of language such as: grammar, generating ideas, scientific vocabulary, spelling, punctuation and coherence.

To end with, making a clear picture about the learning situation and exposing the different sides of the problem leads to present what scientists and scholars say about the issue and how and where they regard the pupils' deficiencies in writing on scientific topics. This is indeed, what is expected to be tackled in the next second chapter of this work.

# Chapter Two

# Literature Review

**2.1- Introduction:**

The second chapter of the present work is divided into two main parts. The first one deals with all that is related to writing as a skill since it is the concern of this investigation.So, it is very useful to describe writing and refer to the different approaches of teaching it and mention the effective stages of the writing process as well as present the types of writing which are taught in secondary school.

With regard to the second part of this chapter, the researcher limits more and more the scope of his work and deals with writing on science referring , first to the features of writing on scientific topics because this type of writing should be precise in stating information, concise in presenting facts  and comprehensible in explaining ideas. This leads to depict an important branch of ESP which is EST; English for science and Technology. The latter is the core of this research since it is based on using English language as a tool to report scientific issues. In this respect, the researcher tackles the discourse of EST by referring, in particular, to widdowson's and Trimble's researches in the field.

Finally and before exposing the different characteristics of the scientific style in case of vocabulary, grammar and The use of impersonal scientific style, the researcher explains the difference between three important disciplines that seem alike but are, in reality, different: Science writing, scientific writing and technical writing.

**2.2- Describing Writing**

Writing is a form of expression and communication which permits learners to communicate ideas, feelings and different attitudes in a written mode. However, it is a complex skill to master even for natives. It is not easy because it requires hard work and lengthy steps. Therefore, writing is more than joining words to form sentences or combine sentences to obtain paragraphs; it

is rather a question of achieving coherence among the different parts of speech in a particular order and linked together in certain ways to hold a meaning. That's why every one has his own way of writing and is free to choose his words, find out sentences and think of the way of arranging them by making a conscious effort. However, this does not mean that the act of writing is a spontaneous activity. On the contrary, there are some basic rules that should be respected and a given process which ought to be followed to develop one's competence in writing. This will be treated in details in the following sections of this work.

### 2.2.1-Writing Pedagogy

Writing pedagogy is an important element within the process of learning to write in the foreign language. It is concerned with presenting a wide range of approaches and methods on teaching writing techniques in a foreign language. In this respect, four main teaching approaches will be discussed .All of them have been applied in teaching the writing skill. They are: the Product Approach, the Free Approach, the Process Approach and the Genre Approach.

### 2.2.1.1- Product Approach

This approach, which is also named "the controlled approach", is based on the principle that teaching writing mainly involves teaching formal accuracy, vocabulary, sentence patterns and cohesive devices (A.Pincas, 1982). It is mainly concerned with how well the writer knows the structure of the language According to Silva (1990), the product theory of writing highlights form and syntax and emphasizes rhetorical drills. This traditional approach emphasizes the mastery of grammatical rules and the memorization of long bilingual lists of vocabulary items. Learners are regarded as imitators to their teachers or to the tapes supplies. The final product, according to Hedge (1988), focuses on the following aspects:

- Getting the grammar right.

- Having a range of vocabulary.

- Punctuating meaningfully.

- Using the conventions of lay out correctly.

- Spelling accurately.

- Using a range of vocabulary.

- Linking ideas and information across, to develop a topic.

- Developing and organizing the content clearly and convincingly.

Not far from this context, Arndt (1987) argues that the importance of imitation and a model in this theory are not only for imitation but also for exploration of analysis. The advantage of this approach is to enable learners to study model texts and do many exercises that let them draw attention to relevant features of a text, and then replicate them in their own writing. However, this could cause a major problem since students may not be able to generalize into other contexts or write creatively as they have to rely upon rote-memory and form (Richards and Rodgers, 1986).

## 2.2. 1.2- Free Writing Approach

Free writing is based on motivating learners to express them selves freely and creatively when writing about any suggested topic. It emphasizes content and fluency rather than form. (Briere, 1966), that's why it is considered as a means of promoting communicative competence .According to this approach, learners write on specific topics without placing too much emphasis on grammar or spelling (Mc Donough and Shaw, 1993) because they realize that there are no "rules" to worry about, such as style, grammar, specific organization, etc. However, with academic writing, students are faced with a whole host of worries like respecting strict guidelines, in format, mechanics, organization and style.

If the Product Approach is more helpful in reinforcing the basic skills of choosing appropriate vocabulary and correct sentence patterns, free writing approach works more with literary classes where learners are allowed to write extensively and use different registers: poetic, narrative, descriptive, expository, …etc. Thus, free writing encourages critical thinking by offering a larger view on a given topic than what is offered by academic writing and activates brain functions such as imagery, intuitiveness, and emotions.

### 2.2.1.3- Genre Approach

The notion of Genre Writing was introduced by (Swales, 1990) who says that the ability to use a genre structure effectively will develop students' abilities to learn successfully in academic contexts. For him, the genre theory is a class of communicative events and that the members of the communicative events share some set of communicative purposes which are identified by the expert members. This means that students learn to write their own texts trying to achieve similar communicative purposes by way of choosing the most suitable and expressive language means for that. Consequently, this approach is especially appropriate for students of English for ESP who need to consider a number of different factors when they write with a certain genre. They need to have knowledge of the topic, the conventions, and style of the genre and the context in which their writing will be read and by whom. According to (Grabe and Kaplan, 1996) Genre –based approaches perceive ways of writing as purposeful, socially situated responses to particular contexts and communities. The idea of emphasizing on the social context in which writing is produced was also introduced by (Badger and White, 2000).

However, this approach has been criticized of not considering the process of producing a text, and regarding learners as passive (Badger and White, 2000).Moreover, as (Flowerdew, 1993) mentions, it requires collaboration with instructors from the disciplines, which may not always be possible.

**2.2.1.4- Process Approach**

While the product approach focuses on form rather than creative thinking (Silva, 1990), the process writing involves generating ideas through brainstorming, having a purpose, ordering information and drafting through peers and continuous feedback (White and Arndt, 1991). In other words, it emphasizes certain procedures such as: pre-writing, drafting, evaluating and revising. For Hyland (2003), the process theory focuses on how a text is written instead of the final outcome. According to (Jordan, 1997) this approach takes into account the principles of learner-centeredness where individuals are encouraged to be more responsible for their own learning through discussion, tasks, drafting, feedback and revision. (Tribble, 1996) explains the process-based approach in teaching academic writing. He says that the students first brainstorm in small groups the topic to be discussed in writing in order to generate ideas before starting to write. This is followed by making an outline of the essay and individually writing its first draft. Students revise their first drafts and give them to other students for peer-reviewing and commenting on. The final stage is editing the essay by the writer himself/herself to eliminate all language errors. Generally speaking, the next coming section in this chapter deals with the process of writing in details and presents the different stages that should be followed in any written attempt.

**2.2.2. - Writing as a Process**

Writing is a complicated task which is done through different steps. It is an activity that considers both form and content. Clarity, organization and Precision are essential features for any successful writing .The basic rule of writing says that you need to think about what you are going to write before you write and go over your writing a few times before sending it out or publishing it. In order to produce an efficient written material, one should respect the following stages.

1- Planning

2- Drafting

3- Revising

4- Editing and proof reading

5- Presenting

**2.2.2.1- The Planning Stage**

It is also called pre-writing phase. In this stage, writers are not only supposed to think about what they are going to say, but also about how they are going to say. In fact, it is not easy to think about what to write and how to phrase it in the same time because this requires much organization and careful planning.

On the whole, the planning stage starts by brainstorming ideas, arguments, words, and phrases which are relevant to the topic designed for writing. Brainstorming is a technique of listing any and all ideas that occur to the learner about the topic, without rejecting any thing as inappropriate or unworkable. However, not all the ideas listed will be used in the final product, some will be deleted or modified and others will be changed. At this level of written production, there is no need to care about spelling, punctuation, or even coherence. It is a kind of free writing where the learner tries to explore the topic and come up with ideas to use later.

During this stage, writers should also pay attention to how they might organize and develop all that has been jotted down before. So, they should organize their ideas in logical sequences depending on the purpose and the form of their written product. In this respect, a wide range of techniques are suggested to achieve a good organization of ideas such as: using a map, a chart, an outline, a ladder technique, etc.

**2.2.2.2- The Drafting Stage**

As soon as the topic has been explored in mind and on paper through prewriting, the writer is ready to start his first draft focusing on content and forgetting about language and mechanical aspects such as grammar, spelling, and punctuation. It is in this stage that the writer communicates his ideas and focuses his attention on the development of meaning and the flow of thought of his writing.

Unlike free writing, a first draft should be arranged in paragraphs, and the ideas should be supported with examples, reasons or illustration. On the whole, the three parts of an essay (introduction, body, and conclusion) should be framed in this stage.

The opening paragraph should present the text's topic. It is preferable to use a stronger opening technique to entice the reader to keep reading. For example, by posing a provocative question; giving an illustrative story, or presenting interesting facts on the phenomenon under discussion. The body paragraphs should each present one idea or aspect of the general topic and begin with a topic sentence that will orient the reader to what follows within the paragraph. Here, it should be necessary to provide enough supporting sentences for the topic sentence, using examples, explanations and quotes. In addition, the use of conjunctions and discourse markers, like: and, or, but, because, however, moreover, etc is very crucial in this stage in order to link between ideas, sentences and paragraphs. The ending should present summative remarks and repeat the text's key idea.

**2.2.2.3- The Revising Stage**

It is very important to go over what has been written once or twice to avoid any possible mistake in the written product. This is called revising. It brings a work to completion. It means evaluating the text's content and making sure what is written was intended in the planning phase. In this stage, it is not easy

to decide what should be deleted, added or changed. So, much reading is recommended to achieve good results. That's why Veit R.and Gould C. (2003) state:

> *"Many writers like to read their work aloud, either for themselves or for some one else. Some discover ideas as they recopy or retype what they have written, since this allows them to read their work slowly and attentively."*

To accomplish this stage, many aspects should be taken into account when revising any piece of writing such as:

1- Writing on the required topic and using relevant arguments and examples.

2- Using the right tenses and the appropriate connectors to link between the different parts of the written product.

3- Joining ideas together with relevant word choices and techniques such as parallelism and emphasis.

4-Diversifying sentence types and lengths (from simple to complex, short and concise to long and elaborate).

5-Refraining from repeating the same ideas and words and using a rich and varied vocabulary.

6- Ensuring coherence and cohesion in sentences and paragraphs

## 2.2.2.4- The Editing and the Proofreading Stage

In this stage of writing, much focus is put on judging the written text for the different mechanics of language rather than content. When we edit, we read through each paragraph of our essay a number of times, paying attention to our sentences and the words that are composed of. During the editing phase, some proofreading may occur and during proofreading, further editing may occur. Here, language accuracy is taken into account where the use of dictionary is widely recommended to check spelling and the respect of punctuation marks, capitalization, numbering and abbreviations is very crucial for an accurate piece of writing. Besides, one makes sure that many conventions such as: the word choice, the subject-verb agreement issues, the

appropriate use of tenses and the sentence structure are correct. For Veit R.and Gould C. (2003):

> *"it is the opportunity to delete imprecise and inappropriate words and ambiguous phrases as well as carefully checking punctuation and spelling"*

## 2.2.2.5- The Presentation Stage

This is the final step for any written product. It is dedicated to some finishing touches of the produced text. Now, and since the piece of writing is ready to be printed, one should take care of some important remarks in order to end well this writing process. For instance, the hand writing should be neat and legible. The indentation should be used too for every paragraph as well as larger spacing between paragraphs.

To end with, the writing process may seem long and tiresome, but it is a guaranteed path to success

## 2.2.3- Types of Writing

Once the writer knows what to write about and how to say it, he should know how to frame his writing i.e. he should decide on the type of essay he will need to write because there are numerous reasons why people write: they write to inform, to entertain, to persuade and to describe things in general. On the whole, there are four types of writing that are commonly used in whatever situation is. So it is very important to discuss this point since secondary school pupils are required throughout their writing assignments to expose, narrate, describe or argue different issues.

## 2.2.3.1- Persuasive Writing

It is also called argumentative writing. It is concerned with defending points of view. The writer should take a position for or against an issue and writes to convince the reader about doing or believing in something .This type of writing is characterized by presenting good reasons and concrete examples

to convince the reader. For example, instead of explaining the reasons of the cold war between United States of America and the Soviet Union, one might be asked to persuade his reader that this war was more about the tendency to dominate the world than the desire to defend human rights in different nations.

## 2.2.3.2- Expository Writing

It is explanatory. It explains how things work and why these things are what they are. So, the goal from the use of this type of writing is to inform, explain, clarify and define.

Effective expository writing contains three important elements such as: the main idea, the supporting details and the conclusion. Thus, writing an expository essay starts with choosing a topic and writing an opening thesis sentence. From there, one can expand the development of the topic and close his writing by a conclusion. Among the main features of this kind of writing is the use of third person voice and the scientific terms instead of informal emotive vocabulary.

## 2.2.3.3- Narrative Writing

It is that type of writing which tells stories, describe events or relate personal experiences. It is based on specific details that make the incident seem alive for the reader who feels eager to know what happens next. Narrative writing can be found in novels, poetry and biographies. It is characterized by the following features:

- Plot structure which includes: introduction, rising action, climax, falling action and resolution.
- conflict
- characterization
- setting
- theme
- point of view

- sequencing
- transitions

## 2.2.3.4-Descriptive Writing

Descriptive writing deals with describing people, objects and places, or reporting events using appropriate details. It can be found in the other three previous types of writing to support other reasons for writing such as story-telling, explanation, persuasion or argument. This type of writing makes readers feel almost as if they are 'there'; experiencing the thing being described. Descriptive writing is very effective when it refers to things that relate to the senses such as sounds and sights. This kind is called sensory description. At the same time, a descriptive writer should be aware of the people's interests in reading because most readers enjoy reading about the important things in life like: fear, loneliness, friendship, growing up, getting old, facing problems... and most of them enjoy reading when it creates a sense of excitement, tension fear or wonder.

In order to achieve effective description, one should consider the followings:
- Choosing words which create vivid and original imagery
- Using description to show in stead of tell the reader what a thing is like because showing is more convincing than telling.
- Avoiding describing nouns and verbs with more adjectives and adverbs and choosing precise vocabulary instead.

## 2.3 -Writing on Science

Writing on science is not an easy task. The complexity of scientific concepts makes it difficult for readers to grasp what writers mean. This is in one hand, in other hand, the way of how to present information and thoughts through using the appropriate language is another obstacle for writing on scientific topics. Generally speaking, there are some characteristics of writing

on science which distinguish this genre of writing from other genres. Let's expose them briefly.

**2.3.1- Features of Writing on Science**

There is a big difference between writing on scientific subjects and creative writing where the writer uses words and phrases in a skillful way to attract the reader. In deed, there is no need to know more about figures of speech to write about any scientific issue, all that you need is to be knowledgeable enough about the subject you are writing about. Thus, teaching someone to write for science involves training them to respect three main features such as: conciseness, comprehensibility and correctness.

**2.3.1.1- Conciseness**

Being concise and precise when dealing with scientific topics in writing is more than a necessity. The writer is responsible for stating the facts in a way that is clear and concise. There is no place for personal thoughts or impressions in exposing or describing a scientific phenomenon.Consecontly, any kind of romanticism or fiction is not allowed if not forbidden in this kind of writings. If some one is asked to write about a rainbow, he would say more about its colors and how it signifies all that is nice and beautiful about life. But a science writer can not do the same. He has to write about the dispersal of the light spectrum under certain environmental and atmospheric conditions.

**2.3.1.2- Comprehensibility**

Any science writing should be easily understood not only by those who may share the knowledge about the topic designed for writing but as well by the general readers who just know how to read. So, it is more than a necessity to avoid complicated style and useless difficult expressions that impede clarity and comprehensibility. It is advisable to focus on conveying information through using simple language and appropriate tools. So, what matters in science writing is the content and not the language.

### 2.3.1.3- Correctness

Presenting wrong facts when writing about scientific topics is the biggest mistake in science writing field. Therefore, a science writer should take care of any information he wants to convey to his readers because science is all about accuracy and preciseness. At the same time, he should not neglect using appropriate language with correct grammar and coherent style for the simple fact that thoughts and ideas can not be clear and easily understood if they are not well-expressed and organized.

### *2.3.2-* English for Science and Technology

English for Science and Technology is a branch of ESP. It is one of the English teaching approaches for students who learn science and technology. The major concern of EST is to teach students English in relation to what they need in the scientific and technological field. According to Dudley- Evans and St. John *(1998)*:

> *"English for specific purposes, and consequently (EST) which is a branch of the former, is centered on the language appropriate to the activities of the discipline it serves in terms of grammar, lexis, register, study skills, discourse and genre"* .

 In fact, many scholars think that the emergence of ESP is mostly due to a great demand of scientists, the reason why English has become the language of science. In this context , *Kennedy and Bolitho (1984) state :*

> *" much of the demand for ESP has come from scientists and technologists who need to learn English for a number of purposes connected with their specialism."*

Generally speaking, there is no a clear-cut line between ESP and EST, but rather a meeting point being the satisfaction of the learners' specific needs. Moreover, the new trend of English for science and technology serves up EST learners with the aspects (grammar, lexis, discourse) that mainly characterize the language of science.

### 2.3.4- Describing EST Discourse

Marsh (2002) defines discourses as:

> *"Frameworks for thought and action that groups of individuals draw upon in order to speak and interact with one another in meaningful ways…. They are historically, culturally, and socially generated patterns of thinking, speaking, acting, and interacting that are sanctioned by a particular group of people".*

Accordingly, one can recognize The EST community by their shared interests, their contribution in science and technology and their practice of scientific and technological discourse. However, describing EST discourse is the concern of many linguists who say so much about the subject. In this research, much emphasis is put on two main linguists who have different views about scientific discourse. They are: Widdowson (1979) and Trimble (1985)  who are prominent figures in describing EST and have contributed, indeed, in giving a comprehensive image about the nature of EST discourse.

With regard to Widdowson (1978), he is against those who think that EST discourse is a specific discourse. For him, such an analysis does not really satisfy the learners' needs. That's why he proposes another view which is rather universal in which he refers to the deep structure and the surface structure. Widdowson states that the deep structure has a relation with the nature of the scientific text where a secondary universal mode of communication is shared by all scientists. He says:

> *"the scientific discourse  is a universal mode of communicating, or universal  rhetoric which is realized  by scientific texts in different languages by the process of textualization"*

This means that there are different types of communication like: diagrams, charts and formulae. These types are called the non-verbal modes. And they are considered as unique to the scientific discourse. In short, Widdowson

regards the scientific discourse as   a composite of two related elements:  the deep structure that holds the feature of textualization which is realized by means of language or the surface structure.

Later on Widdowson has refined his theory and proposed the concept of schemata which he defines as:

> *"cognitive constructs which allow for the organization of information in long-term memory and which provides a basis for prediction"*

For Widdowson, the scientific languages' knowledge contains two levels: The systematic level and the schematic level. The former  deals with the language as a system which includes phonology  and  syntactic-semantics. The latter includes universal frames and  rhetorical  routines which are linked to the language of science. In short, Widdowson regards the scientific discourse as

Unlike Widdowson who relies in his theory on deep and surface structure, Tremble thinks that the scientific discourse is based on the concept of rhetoric which he defines as:

*"the process a writer uses to produce a desired piece of text. This process is basically one of choosing and organizing information for a specific set of purposes".*

According to him, EST rhetoric is concerned with the way a set of information of a given type of a text is organized for specific objective. Thus EST rhetoric takes into account the larger discourse units in which information are organized. These discourse units are well-explained by Tremble (1985) in what he calls EST Rhetorical Chart.

*A. The objectives of the total discourse*

> *Examples:*          *1. Detailing an experiment*
>
>                   *2.  Making a recommendation*
>
>                   *3.  Presenting new hypotheses or theory*
>
>                   *4.    Presenting   other   types   of   EST information*

 *B. The general rhetorical functions that develop the objectives of level (A)*

*Examples:*                    *1. Stating purpose*

*2. Reporting past research*

*3. Stating the problem*

*4. Presenting information on apparatus*

*used in .*                          *an experiment*

*a) Description*

*b) Operation*

*5. Presenting information on experimental*

*.*                          *procedures.*

*C. The specific rhetorical functions that develop the general rhetorical function Level B*

*Examples:*                    *1. Description: physical, function, and process.*

*2. Definition*

*3. Classification*

*4. Instruction*

*5. Visual-verbal relation*

*D. The Rhetorical techniques that provide relationships within and between the rhetorical units of level c.*

*Examples:*          *I. Orders*

*1. Time orders*

*2. Space orders*

*3. Causality*

*II. Patterns*

*1. Causality and result*

*2. Order of importance*

*3. Comparison and contrast*

*4. Analogy*

*5. Exemplification*

*6. Illustration*

**Figure 2:    EST Rhetorical Process Chart (Trimble, 1985, p.11)**

As shown in the chart above, Trimble (1985) thinks that EST discourse can be divided into four rhetorical levels. First level A presents the objectives of EST discourse which is concerned with transmitting information from writers to readers. Second level B highlights the different functions that develop the objectives of the level A. Third, if level B concerns the general functions of the rhetorical discourse, this level C considers specific rhetorical functions that are used in EST like : definition, description, instruction, classification, and visual- verbal relationships. Finally, level D classifies the different rhetorical techniques that establish relations between and within the different units of Level C. They are divided into two categories: orders and patterns. In turn, each category contains a number of rhetorical techniques as mentioned in the chart above. On the whole, according to Tremble (1985) EST discourse can be presented through a wide number of rhetorical levels to achieve particular functions for specific purposes. Therefore, both views (of Trimble and Widdowson) emphasize the specificity of the scientific discourse in possessing a universal framework that stresses the rhetorical functional approach of EST discourse.

In fact, not only Widdowson and Tremble who seem to be interested in the notion of discourse but there are others like: Mavor & Trayner, Soler, and Rowley-Jolivet, who have been influenced by Swales' Genre analysis. The latter deals with purpose and organization of texts. Swales (1990) States:

> *"genre is formed by a body of communicative events, and that a communicative event is one in which language and or paralanguage plays both a significant and an indispensable role."*

One can easily deduce that the scientific and the technical genres are not excluded from this view since they include the nature and organization of words in scientific discourse.

### 2.3.5 - Science Writing, Scientific Writing and Technical Writing

It is very necessary, throughout this research, to clarify the difference between the following kinds of writing: Science writing, scientific writing and technical writing because only one of the three is the concern of this little investigation. The purpose from science writing is to write about scientific topics and present information for general readers while scientific writing addresses scientists and all those who share knowledge of a particular subject. Technical writing concerns professional documents such as proposals and instructions and technological applications of principles of science, such as computer documentation. Business writing, of which technical writing is a subset, presents a broader range of information related to the functioning of a company or government agency.

To be qualified enough in science writing; a science writer should read scientific journals so as to discover information that might be of interest to general public. Besides, they can also add information from other sources and simplify the news event to their audiences in a way that is easy to grasp. On the whole, science writing differs from the other types of writing, as it concentrates on presenting information about science to the general public in, for example, articles for newspapers, magazines, and newsletters; press releases; and scripts for television and radio broadcast.

At the end, one should note that the concern of this little investigation is science writing which is the field of secondary school pupils.

### 2.3.6- Characteristics of Scientific Style

Before speaking about the characteristics of the scientific style, one should present a general image about the scientific text which is composed as (Walsh, 1982) thinks of three components such as: the linguistic, the conceptual and the rhetorical component. The concern of the first component is syntax and vocabulary. For Walsh (1982), the scientific text is characterized

by the use of regularly specific terms to each special subject area, sub-technical vocabulary specific to none, and general English vocabulary. However, there is no specific scientific syntax because it is it is similar to that of GE. With regard to the second conceptual component, it is about the knowledge that the reader has about a text relying on the writer ideas. The third rhetorical component is concerned with the way language is presented according to a number of objectives and functions.

Generally speaking, there are both similarities and differences between scientific writing and other types of writing. Concerning similarities as mentioned above, it is a matter of paying attention to proper grammar, spelling, and punctuation, as well as taking care of coherence and structure. With regard to differences, it is a question of style. Scientific writing generally avoids the use of the first person singular or plural (I and we).There is much use of the third person and the passive voice. For instance, It is preferable to say: "the sickness is diagnosed" instead of saying: "I diagnose the sickness". However, a paper written entirely in the passive voice would be difficult to read and remember, and it may put a reader to sleep. This is on one hand, on other hand; much passive may cause ambiguity by submerging responsibility for an action when a more open approach would be clearer to readers.

In addition, inanimate objects (like proteins, genes etc) should be described in third person, not with possessive terms (e.g., instead of saying "its *att* site", say "the chromosomal *att* site"). Another characteristic is that sentences should not start with numbers. For example, one should write "A100-Ml of acid was added instead of writing "50 mL of acid was added,"

The use of the appropriate tenses in writing about science matters is another important characteristic of scientific writing. In this respect, Burrough-Boenisch (2003) made a research about the present tense conventions in scientific texts. He discovered that the nonnative English speakers of her study used the present tense differently from the normal

conventions of their scientific community. The result was that the present simple was used to express facts and truths whereas the past simple was used to speak about past processes and events. He concluded that it was difficult for those who were accustomed to regular science English conventions to understand their writing. However, Burrough-Boenisch (2003) stated that it was not clear when writing or reading scientific English, whether nonnative English speakers

> "*rely on their L1 conceptualization of temporality signal conveyed by tense*" or "*behave like native speakers who use tense grammatically but 'unconventionally' and yet pass the scrutiny of journal editors and referees*".

In any case, the easiest way for writers to minimize miscommunication about the generality or specificity of the information being presented, is to keep to the tense conventions in scientific English. This is certainly the safest option for non-native speaker writers who may be unskilled in deploying other devices to signal the specificity or generality of information. (Burrough-Boenisch, 2003)

In scientific writing, it is preferable not to use phrases that do not contribute to understanding or add something new to meanings. For instance, there are some expressions that can be shortened or deleted without affecting the meaning of sentences as in the followings: "in order to" can be shortened to "to", the phrase "the fact that" should be deleted, etc. In brief, it is very crucial to avoid using words and expressions that do not serve to make things clear. A writer should also specify and chooses the right words to express the right meanings i.e. if the same word is modified by several expressions, they should be arranged in a way to clarify which explicit word they modify.

Another important characteristic of science is the use of singular and plural in writing. In this respect, mass nouns such as distances, times, masses, volumes and volts are used in the singular form because such things are measured in real numbers. For example, we say: "One hundred grams of

flour." "Twenty five hours is not sufficient to do the job." However, integers are used in the plural. For instance, we say: "Fifty sheep were vaccinated." "Six species are dangerous"

## 2.4 – Conclusion

All that is said so far by scholars and language researchers in the different sections of this chapter proves that writing is not an easy task. It needs a huge work and more efforts from both learners and teachers to achieve satisfactory results.

The fact of treating scientific topics in writing is another immense handicap that worsens more and more the pupils' writing process. The reality shows that the difficulty does not only lie in the ignorance of how to teach the skill of writing for pupils, but the matter is beyond the teacher's role and his competencies. Thus, there are many other aspects which should be taken into account to facilitate the pupil's writing tasks on scientific subjects.

As far as the first part of this chapter is concerned, teaching writing skill efficiently necessitates a mastery of writing pedagogy and an awareness of the different stages of writing process starting from planning to write and ending with presenting what is written. Besides, teaching pupils the various types of writing which may correspond with the learners'' different living situations in case of narrating, exposing, arguing or describing is also fruitful to encourage pupils to write.

With regard to the second part of the chapter, much discussion is devoted to the fact of writing on scientific issues. It is concluded that knowing more about how to teach writing skill helps a lot to minimize the problem of treating scientific topics in written production. As a result, pupils become able to learn and memorize scientific vocabulary and use impersonal scientific style in their writings through mastering grammatical rules and respecting spelling and punctuation norms. In short, pupils feel they are capable of identifying the

characteristics of scientific discourse and depict whatever topics designed for writing.

# Chapter Three

# Data Treatment and Analysis

## 3.1- Introduction

As mentioned in the previous chapters, this study aims at investigating the reasons of the third year secondary school pupils' difficulties in writing on scientific topics. So, what are the main causes behind their inability to produce coherent meaningful paragraphs in well-structured essays?

In this part of research, which seems to be purely practical, the researcher tries to discuss some actual problems that pupils face and investigate the main obstacles that teachers encounter in teaching the writing skill in general and teaching writing on scientific topics in particular. It is an attempt to bridge the gap between the practical procedures and the theoretical domain that precedes practice. So, taking into account all that has been said so far about writing on science, and for the sake of testing the hypotheses stated forewords the present work is based on three tools of research to collect data from population; two questionnaires : one for third year secondary school pupils and another one for teachers. In addition, a writing test is submitted for the same group of pupils to diagnose their writing deficiencies as well as to know some of the main causes behind their writing problems.

In brief, this chapter reveals the main reasons of the pupils' reluctance in writing on scientific matters. It also shows how these reasons have certain influence on the pupils' ability to write successful essays. This will be tackled in details throughout the analysis of the findings which illustrate how these factors are interrelated to complicate more and more the act of writing on this kind of topics.

## 3.2-The Pupils' Questionnaire

The practical side of the present work is opened by collecting data from thirty secondary school pupils who have a beginner intermediate level and an average age of eighteen years old. All of them belong to the scientific stream and learn English as a second foreign language after French.

The data is gathered through submitting a questionnaire for the pupils, which is considered as one of the most effective tools of getting information and treating data gathered from informants. It provides anonymity for the respondent and offers the possibility of a high return rate and provides standardized questions (Munn and Drever, 1990).

The pupils' questionnaire includes several questions about five main aspects of investigation. First, the learners are asked about their interest in learning skills where they have to opt for the most important skill for success in learning English. Second, they are needed to clarify the problems they face in the nature of the topics they write about i.e., the scientific topics themselves seem to be an obstacle in the process of writing. Third, the pupils are questioned about the role of the teacher and his methodology in teaching writing on science, that's to say whether or not pupils are satisfied with the way teachers teach writing. Fourth, they are asked about the difficulties they have in the mechanics of language such as: vocabulary, grammar, structure…etc. Finally, they are given the opportunity to state their major psychological factors behind their difficulty in dealing with scientific subjects in writing.

### 3.2.1-Analysis of the Pupils' Questionnaire

The pupils give their views on different points related to their learning process in writing on scientific subjects. Their responses are analyzed in details and interpreted so as to reveal their real deficiencies in writing.

### 3.2.2 – Learning Skills

Pupils are invited to opt for the most important skill for success in learning English. Their answers of the question about the first aspect of investigation are illustrated in the following table.

| Pupils 'interest in learning skills | Number | Percentage (%) |
|---|---|---|
| Speaking | 18 | 60 % |
| Writing | 02 | 6,66 % |
| Reading | 05 | 16,66 % |
| Listening | 05 | 16,66 % |

*Table 3.1: The Pupils' interests in English learning skills*

The results above show that the third year secondary school pupils are not interested in writing skill and do not like engage in writing process whatever are the topics suggested for discussion. Only 02 pupils out of 30 who think that writing is an important skill for success in English learning whereas 18 others see that speaking is the best skill for acquiring good English. (See appendix N°01). This negative attitude to wards the skill of writing indicates that there is a whole host of reasons behind the pupils' reluctance in written production. This is will be revealed during the next steps of this investigation.

### 3.2.3 – Writing on Scientific Topics

Now and after finding out that third year secondary school pupils fear the act of writing, what about dealing with scientific topics which are their concern in written production in their learning process? The results in the table below answer this question in precise numbers and percentages.

| Investigated points | Yes | | No | | Sometimes | |
|---|---|---|---|---|---|---|
| Preferring to write on scientific topics. | 02 | 6.66% | 06 | 20 % | 22 | 73.33% |
| Preferring to write on literary topics. | 12 | 40 % | 10 | 33.33% | 08 | 26.66% |
| Difficulty in generating ideas. | 15 | 50 % | 02 | 06.66% | 13 | 43.33% |
| Difficulty in understanding the scientific vocabulary of the topics designed for wrtg | 09 | 30 % | 07 | 23.33% | 14 | 46.66% |
| Listening to the teacher's instructions before starting to write. | 08 | 26.6% | 07 | 23.33% | 15 | 50% |
| Students' need of more time for thinking. | 06 | 20 % | 11 | 36.6 % | 13 | 43.33% |

*Table 3.2: Pupils perceptions on writing on scientific topics.*

### 3.2.4 – Analysis:

In order to reveal the learners' problem with writing on scientific topics, pupils are asked six precise questions that touch the core of the problem. From the beginning, pupils show their dislike to write on this kind of subjects ( only 6.66% )  and nearly 40 % of them prefer dealing  with literary ones instead.In fact , this attitude explains the pupils' fear from tackling any scientific matter. Their first obstacle is the inability to generate ideas on this kind of topics (50 % of the pupils) and their failure to understand the scientific vocabulary of the topics designed for writing( only 23.33% of the pupils who are able to understand the scientific vocabulary  items), the reason why , not many of them are interested in listening to the teacher's instructions before starting to write. ( not more than 8 pupils  out of 30). Besides, many pupils express their need for more time to think and write on such kind of topics.

### 3.2.5 – The Teacher's Role

Another investigated factor that may affect the pupils' reluctance in writing on scientific topics is the teacher who has a great responsibility in teaching the writing skill effectively. In this respect, a wide range of questions are asked on pupils to expose the real role played by teachers in the classroom. Here are the pupils' responses in details.

| Investigated points | Yes | | No | | Sometimes | |
|---|---|---|---|---|---|---|
| Warming up the topics of written expression. | 20 | 66.66% | 05 | 16.66% | 05 | 16.66% |
| Explaining the scientific vocabulary   items of the topics designed for writing . | 19 | 63.33% | 04 | 13.33% | 07 | 23.33% |
| Providing clear instructions when writing on scientific topics. | 06 | 20% | 11 | 36.66% | 13 | 43.33% |

| | | | | | | |
|---|---|---|---|---|---|---|
| sufficient practice in the use of punctuation. | 10 | 33.33% | 11 | 36.66% | 09 | 30% |
| sufficient practice in developing the grammatical part of writing. | 13 | 43.33% | 08 | 26.66% | 09 | 30% |
| sufficient practice in spelling. | 05 | 16.66% | 17 | 56.66% | 08 | 26.66% |
| Correction of pupils' written Production . | 10 | 33.33% | 07 | 23.33% | 13 | 43.33% |
| Teacher's bad reaction towards errors. | 04 | 13.33% | 14 | 46.66% | 12 | 40% |
| Providing feedback on the writing homework | 17 | 56.66% | 05 | 16.66% | 08 | 26.66% |
| Providing extra help for the weak students in writing. | 04 | 13.33% | 24 | 80% | 02 | 06.66% |

*Table 3.3: The teacher's role in teaching writing skill.*

## 3.2.6 – Analysis

The results above show that although pupils recognize their teachers' efforts in brainstorming the topics meant for writing and explaining their vocabulary items, they don't hide that their teachers fail to provide clear instructions about the topics designed for writing. (Only 06 pupils out of 30 who really understand the teachers' instructions). In addition, many of the pupils state that teachers don't allow for sufficient practice of grammar, structures and particularly spelling in the writing sessions (only 05 pupils out of the group who think they are able to spell words correctly). Another important point which is investigated in this research is whether teachers correct their pupils written production .Accordingly, results indicate that one third of the pupils state that teachers neglect evaluating their works.   Some teachers justify this by the over crowded classes they teach, the time limit of the teaching sessions and the long syllabus to be covered.  With regard to the

teacher's attitude towards their pupils' errors, pupils state that they receive positive reaction towards their short comings but at the same time this positive reaction does not concern all the pupils as most of them ( nearly 80% ) do not get any extra help.This attitude, undoubtedly, make learners less motivated and not interested in the writing skill on the whole.

### 3.2.7 –The Difficulty in the Mechanics of Language

Writing on scientific subjects is not only difficult because of the nature of the topics (scientific) that seems difficult for the learners to deal with or the less motivating role played by teachers in teaching writing but there may be other factors which are related to the different mechanics of language as shown in the table of findings below.

| Investigated points | never | | sometimes | | always | |
|---|---|---|---|---|---|---|
| Using appropriate scientific vocabulary. | 00 | 00% | 12 | 40% | 18 | 60% |
| Applying grammatical rules to writing. | 04 | 13.33% | 09 | 30% | 16 | 53.33% |
| Expressing ideas in writing. | 01 | 3.33% | 21 | 70% | 08 | 26.66% |
| Using correct punctuation | 10 | 33.33% | 08 | 26.66% | 12 | 40% |
| Using correct spelling. | 03 | 10% | 10 | 33.33% | 17 | 56.66% |
| Understanding writing instruction about scientific topics. | 03 | 10% | 18 | 60% | 09 | 30% |
| Forming sentences. | 05 | 16.66% | 09 | 30% | 16 | 53.33% |
| Establishing cohesion in writing. | 00 | 00% | 06 | 20% | 24 | 80% |

*Table 3.4: The pupils' difficulty in the different aspects of language*

### 3.2.8 – Analysis

The data above demonstrates that expressing ideas fluently in writing through using appropriate scientific vocabulary, applying grammatical rules in writing, understanding writing instructions about scientific topics and establishing cohesion in writing are the most problematic area in the questionnaire.

The pupils show their handicap in thinking independently and expressing all that they have in mind easily. They suffer from a" lack of ideas». Consequently; they need a kind of guidance to develop their self confidence and belief in their ability to write. They are often unable to deal efficiently with academic or common every day topics (Mukkttash, 1983).One possible reason for pupils' inability to have ideas is due to their limited general English reading and insufficient scientific culture.

The learners' limited scientific vocabulary (60%of the pupils) and the difficulty to use specific terms in writing and knowing how to connect them (cohesion) let them feel afraid of misspelling words that could impede their writing ability. In this respect,
(Fageeh, 2003) has already stated that vocabulary is the kind of common problem faced by language learners, which may cause apprehension in their writing.(Grabe and Kaplan1996 and Hill  1986) also claim that language writing difficulties may involve in limiting vocabulary.

Concerning the application of the grammatical rules in writing, pupils feel the need of more extended work in grammar in order to improve grammatical knowledge (53% ).The difficulty lies in using tenses appropritely and dealing with parts of speech.One possible reason for pupils problem with grammar is the teachers' unclear strategy of teaching it.Another is the pupils' inability to understand the complex grammatical rules they are taught.

Another obstacle in learning how to write on scientific topics that let pupils complain a lot is the inability to understand the writing instructions

provided by teachers, i.e., learners find it difficult to comprehend the teachers' questions meant for writing on scientific topics.( only three pupils out of thirty who can understand the teacher's writing instructions).

### 3.2.9 – Psychological Problems

The previous findings show that the third year secondary pupils don't like dealing with scientific topics in writing and some of them prefer to write on literary subjects instead. Certainly, there are some psychological factors behind this reluctance. What is coming next is an attempt to shed light on the main psychological reasons that impede learners from writing on scientific matters. The table below summarizes the results of this aspect of investigation.

| Psychological problems | Number of pupils | percentage |
|---|---|---|
| Fear and anxiety | 15 | 50% |
| Lack of confidence | 03 | 10% |
| Lack of motivation | 10 | 33.33 % |
| No psychological problem | 02 | 06.66% |

*Table 3.5: The pupils' psychological problems in writing on scientific topics.*

### 3.2.10 – Analysis

Writing on scientific topics is not only difficult for the learners because of the teacher's role which is not motivating or the bad mastery of the different aspects of the scientific language , but there are other psychological factors which are related to the learner himself. The fear from writing on scientific subjects takes the biggest part in the pupils psychological state (50%) . The fear from making mistakes and failing to write coherent meaningful essays through using the appropriate scientific vocabulary makes the pupils unable to

engage in writing tasks. This fear lets them less motivated and less self-confident to tell what they know about scientific issues in a written form. The graphic display below illustrates the pupils 'affective state towards the act of writing on scientific topics.



Diagram 3.2 : Pupils'psychological problems in writing on scientific topics
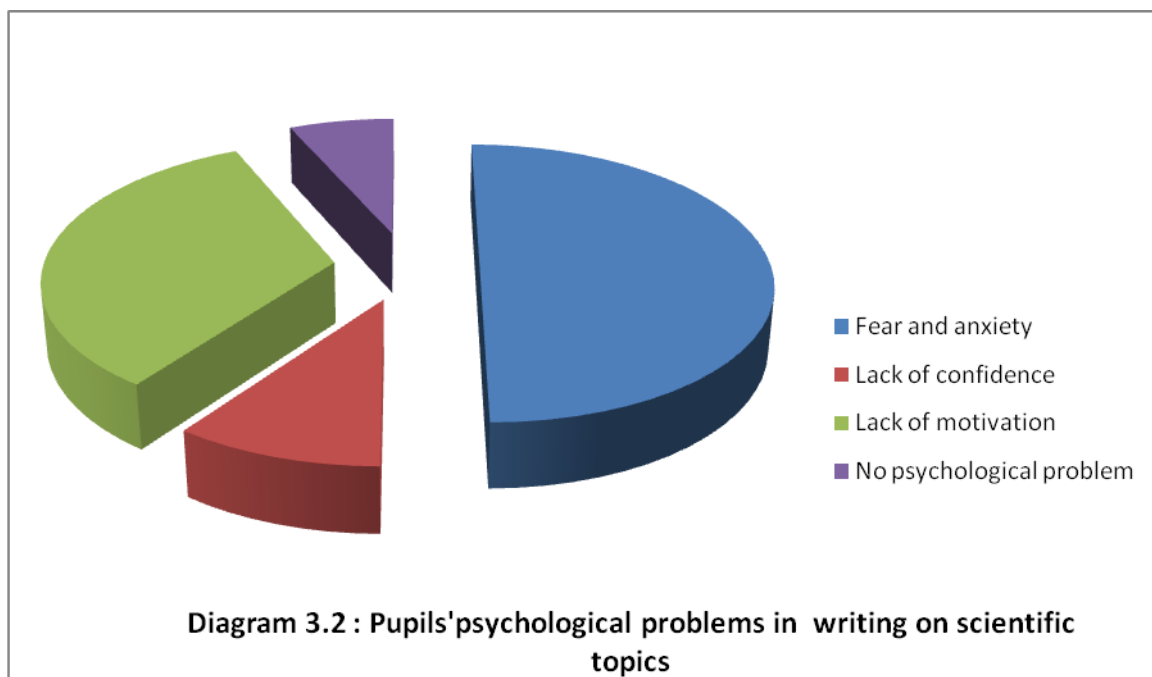
This diagram presents the different psychological problems that let pupils unable to write on scientific topics. As it is mentioned, fear and anxiety takes the biggest part in the pupils' affective state followed by a lack of motivation then a lack of self-confidence.

**3.2.11-Interpretation**

In conclusion to the questionnaire submitted for the pupils, the findings indicate that learners fear the act of writing on the whole and the fact of dealing with scientific topics in particular. The informants don't hesitate to show their dissatisfaction with their teachers' role in teaching writing skill since most of them see that their teachers fail to provide clear instructions about the subjects meant for writing and this is, indeed, a great problem. How can a pupil write about a given topic if he is not well-informed about what to write about? This is in one hand, in other hand, the no correction of the pupils'

written production and the neglect of the weak pupils who don't receive any extra help make them less motivated and unwilling to write. Besides, the pupils' limited scientific vocabulary and their lack of an efficient strategy of generating ideas and applying grammar in writing worsen more and more the situation. All these factors added to other psychological reasons such as : fear and anxiety, lack of self-confidence and motivation lead to the pupils' difficulties in writing on scientific topics.

### 3.3-The Teacher's Questionnaire

In addition to the third year secondary school pupils, teachers have been taken into account in this study too. That's why another questionnaire is submitted for a group of 10 secondary school teachers. Their personal views on the pupils' failure in writing on scientific subjects are taken into consideration because they are very close to the learners and know more about their real needs in learning language.

Concerning their professional career, all of the ten teachers have a licence degree and an average experience not less than ten years in the field of teaching. They teach English for different streams ; literary,scientific , mathematic and technical streams.They live in the same town  where the pupils study.

In practice, teachers are asked about four main aspects that touch the pupils' difficulties in writing on scientific subjects. First, and for the sake of opening the questionnaire, teachers are required to opt for the major learning skill that the third year secondary school syllabus gives much importance ; whether it is reading, speaking, writing or listening. Second, they are needed to state their major problems in teaching the writing skill in relation with the syllabus they apply, the approach and the techniques they adopt and the classroom methodology they follow. Third, they are asked about their different roles in teaching writing skill in case of motivating learners, explaining scientific vocabulary, providing pupils with clear instructions when asking

them to write, providing sufficient practice in teaching grammar, punctuation, spelling and giving the right feedback to their pupils' writing attempts. Finally, and in order to reveal the pupils' affective state towards writing on scientific topics, teachers are also required to clarify the major psychological problems that refrain learners from dealing competently with scientific issues .

Because they are the most to be aware of the learners needs in learning language, asking teachers about their learners' difficulties in writing on scientific matters is very necessary and useful .Consequently, their remarks and points of view are considerably taken into account in this little research. On the whole, the table below illustrates plainly the results of the teachers' questionnaire.

| Aspects of investigation | | yes | No | Some-times |
|---|---|---|---|---|
| **1) Pedagogy** | **1-**The programme of English fits the pupils' levels. | 00% | 70% | 30% |
| | **2-**The syllabus designer allows teachers to use their own teaching strategies. | 20% | 00% | 80% |
| | **3-**Teachers receive regular training in teaching writing skill. | 00% | 90% | 10% |
| | **4-**The training made at the university was sufficient for teachers to teach. | 00% | 80% | 20% |
| **2)- Writing on scientific topics** | **1-**Writing on scientific topics is difficult because of the text-book in use. | 30% | 30% | 40% |
| | **2-** Writing on scientific topics is difficult because of the approach and the techniques use. | 20% | 10% | 70% |
| | **3-** Writing on scientific topics is difficult because of the learner's lack of motivation. | 80% | 00% | 20% |

| | | | | |
|---|---|---|---|---|
| | **4-** Writing on scientific topics is difficult because of the teacher's classroom methodology. | 20% | 20% | 60% |
| **3)-The teacher's role** | **1-** Teachers encourage pupils to write on scientific topics. | 50% | 20% | 30% |
| | **2-**Teachers explain the scientific vocabulary items of the topics designed for writing. | 70% | 00% | 30% |
| | **3-**Teachers provide clear instructions when writing on scientific topics. | 60% | 00% | 40% |
| | **4-**Teachers provide sufficient practice in developing grammar. | 50% | 10% | 40% |
| | **5-**Teachers provide sufficient practice in spelling. | 10% | 70% | 20% |
| | **6**-Teachers allow for sufficient practice in the use of punctuation. | 30% | 10% | 60% |
| | **7-**Teachers evaluate the pupils' written production. | 50% | 10% | 40% |
| | **8-**Teachers give feedback to the pupils' writing attempts. | 50% | 10% | 40% |
| **4)-Pupils' psychology** | **1-**Pupils fear the act of writing on scientific subjects. | 70% | 10% | 20% |
| | **2-**There is humour in teaching the lesson of writing. | 20% | 40% | 40% |
| | **3**-Teachers shout on their pupils when they make mistakes. | 00% | 80% | 20% |
| | **4-**Teachers let pupils correct themselves when they make mistakes. | 50% | 00% | 50% |
| | **5-**Teachers praise pupils when they make progress in writing. | 80% | 00% | 20% |

*Table 3.6***: *The teachers' Perceptions on Pupils' Difficulties in Writing on Science*

### 3.3.1- Analysis of The teacher's Questionnaire

From the beginning, teachers admit that learners do not only have difficulties in writing on scientific subjects but they are weak in the act of writing on the whole. Although the designer of the third year secondary school syllabus puts so much focus on developing the skills of reading and writing (08 teachers out of 10) to prepare the learners for the Baccalaureate Exam , pupils still have difficulties if not tremendous weakness in written production , particularly writing on scientific issues. This noticeable failure is due to a wide range of reasons in the eyes of teachers who are the most acquainted of the learners needs in the field.

The first obstacle that teachers encounter when teaching their pupils writing on scientific topics is the English syllabus that should be applied and respected. Most of the teachers (70%) see that this programme does not really achieve the intended objectives and the learning goals set by the ministry of education because of its length and vague strategy as it is mentioned by one of the teachers in his additional comment of the questionnaire when he says:

> " *The teaching strategy is not clear as we apply Competency- based Approach in teaching but when we test our learners we are still using old classical methods*". (See samples of teachers' questionnaires).

At the level of pedagogy, most of the teachers (nearly 90 %) state that they receive no training in teaching writing skill, the reason why they use their own appropriate techniques in teaching. Consequently, the results are not very satisfactory. Let alone the training they made at the university which was not really sufficient (08 out of 10 teachers who admit that).

With regard to the linguistic level, teachers are asked about their role in providing their learners with the different aspects of teaching writing on science topics i.e. their duty in explaining the scientific vocabulary items of the topics designed for writing, their competence in providing clear

instructions and their responsibility in developing the grammatical part of writing (tenses punctuation, spelling, …).

The results of the questionnaire show that most of the teachers if not all of them are doing their job in developing the pupils' linguistic side of writing on scientific matters while the reality indicates that learners do suffer from most of these aspects. Any way, this can be confirmed in the next coming steps in testing pupils about the different aspects of language through writing. The only exception that teachers raise is the fact of teaching spelling which is not given enough interest due to the absence of a clear technique in teaching this aspect of

language (not more than10% of teachers who allow for sufficient practice in spelling) . In deed, teaching spelling especially the scientific items is very necessary for the learner to enable him to memorize words correctly and use them appropriately. Thus, one of the efficient ways to do that is to encourage dictation.

Concerning the pupils' affective state in dealing with scientific matters, teachers agree that fear and other psychological factors like anxiety and the lack of motivation play an important role in pupils' reluctance in writing.70% of the teachers see that pupils fear writing on scientific topics and 80% of them regard the lack of motivation as the most important factor of the learners' psychological state. However , these factors do not seem to be the only unique reasons , there are other causes like the need to provide learners with the right feedback on their written production and praise them when they make progress in writing.

### 3.3.2-Interpretation

The results of the questionnaire submitted for teachers reveal many realities under which pupils lack the necessary competence to depict scientific topics in writing. It is very clear that teachers bear some responsibility in the pupils' deficiencies in writing. However, putting the whole responsibility on

teachers is not fair because there are other factors which are not less efficient. In deed, the findings above show that teachers have problem with the application of the English syllabus which seems to be long and unclear in strategy. It is vague because of the contradiction between what is learnt and what is tested, that's to say, teachers use Competency -based Approach in teaching but apply old classical methods in testing their learners. As a result, this attitude does not serve for better achieve the designed educational goals of the ministry.

At the level of pedagogy, teachers receive no trainining sessions in teaching writing, the reason why some of them ignore how to apply the new Competency -based Approach in writing. Consequently, most of them use their own techniques and personal strategies in teaching the skill of writing. As a result of this individual attitude, they have a problem with teaching spelling which is not given enough time and interest due to an absence of a clear strategy of teaching this aspect of language.

Finally, concerning the last aspect of investigation in the teachers' questionnaire, the pupils' good psychological state is very important for the success of any learning process. However, the teachers' responses reveal that learners do suffer from a lack of motivation and fear from depicting any scientific matter in writing.

## 3.4-The Pupils' Writing Test

With regard to the third tool of research which is testing the pupils' ability to write, the same group of pupils is asked to write a short essay on a specific scientific topic. The aim from this essay test is, undoubtedly, to show the pupils shortcomings in writing and reveal the real obstacles that refrain them from dealing freely and easily with scientific topics.

Generally speaking, the test is defined as an activity whose main purpose is to convey how well the learner knows or can do something. It gives a score which is assumed to define the level of knowledge of the learner and diagnose

specific strengths and weaknesses as well as measure the learner's achievements. It also enables teachers to evaluate the pupils' abilities to organize, integrate, interpret material and express them selves in their own words.

It should be noted that the suggested test for the learners is taken from the third year secondary school book "New Prospects", Unit five: It's giant leap for mankind. Sequence: Think, pair, share, page: 141.

In brief, the pupils are asked to write an expository presentation of the Moon using notes given in a fact file. They may also conclude with a reminder about man's attempt to explore the Moon.( see the test in appendix 3).

### 3.4.1-Results and Analysis of Pupils' Writing Test

The analysis of the test given to the population is based on taking into consideration different aspects of language such as: generating ideas, grammar and structure, spelling, vocabulary and coherence. Every aspect is analyzed independently and carefully in relation with the learners' written production. At this level of investigation, one should point out that the pupils' writings are corrected by using "correction symbols" which help to find the possible mistakes and correct them. The following correction symbols table suggested by Jeremy Harmer illustrates very well how the correction of the pupils' work in this research is done.

| Symbol | Meaning | Example error |
|--------|---------|---------------|
| S | A spelling error | The answer is <u>obvius</u> |
| WO | A mistake in word order | I <u>like very much</u> it |
| $\mathcal{G}$ | A grammar mistake | I am going to buy some furnture<u>s</u>. |
| T | Wrong verb tense | I <u>have seen</u> him yesterday. |
| C | Concord mistake | <u>People is</u> angry |
| £ | Something has been left out | He £ told that he was sorry. |

| | | Iam interested on Jazz music. |
|---|---|---|
| WW | Wrong word | |
| {} | Something is not necessary | He was not {too} strong enough. |
| ?M | The meaning is unclear | That is a very excited phptograph |
| P | A punctuation mistake | Do you like London. |
| F/\| | Too formal or informal | Hi Mr Franklin, Thank you for your letter… |

*Table 3 .7*: *Correction symbols (Jeremy Harmer, 2007)*

After submitting the test for the learners and giving them enough time to think and write on the topic, correction reveals lots of remarks on the following aspects of language:

### 3. 4.1.1 – Generating Ideas

The pupils find it quite difficult to use the notes given in the fact file to write correct meaningful sentences and conceptualize ideas. It is not easy for more than 70 % of them to add other new ideas to what is done as notes and the proof is the very limited paragraphs they write. One possible reason for their inability to have ideas is because of their limited general English reading and insufficient conversation practice outside the classroom. The reason why they resort most of the time to translation from mother tongue to the target language. However, translation does not always solve the problem; on the contrary, it sometimes leads to confusion and meaninglessness. According to (Carrell, 1988) the more exposure learners have to target language, the more ideas they will develop.

Another important remark on the pupils' written production is their failure to formulate new sentences by using the cues given in the fact file. That's why they keep going round and round as it is shown in the following samples: "

*...as to the temperature is: sunlit side:+110C°and lunar nights:170C°,...the surface gravity :0,16,....the diameter is 3.476km"* ( see appendix 3).

At the end, it should be noted that some learners (05 out of 30) did not write any thing in their test papers. This could explain their difficulty of transforming the given cues into ideas and the inability of engaging in the act of writing in general and the fact of dealing with scientific topics in particular.

Generally speaking, one of the best ways of motivating learners to generate ideas is to encourage extensive reading which could help to provide general knowledge and stimulate ideas.

### 3.4.1.2 – Grammar and Structure

The findings show that pupils need more extended work in grammar in order to improve their grammatical knowledge. The written test reveals that most of them (nearly 80 % ) don't respect grammatical rules in writing. It seems as if they have no basic grammar rules.( *…the moon…he is., it turn around the earth…, our planet have a moon…, we must be with space program because it help our to answer many question…*).It is very clear that pupils do have a problem with the "s" of the third person singular in present simple or the"s" of the plural form. (Ryan , 2005) thinks that the formality of education system of Arabic speaking learners of English has focused on traditional drills and written exercises. The errors which they produce in English could be the cause of the influence of their first language.

Another problem that pupils face at this level of language is that they fail to apply what they learn in grammar sessions in their writing tasks. i.e., what they take in grammar, they keep it for their grammar class, since otherwise how can one explain the efforts made by teachers in teaching grammar and different structures during the whole school year.

It is found that most of the pupils have difficulties in dealing with tenses and parts of speech. For example, they get confused with ' *have, has and had*'. In fact, the difficulty in using appropriate tenses in writing is problematic for

most third year secondary school pupils. In this respect (Carrell , 1988) states that it is preferable to include in the course of lectures visual aids, demonstrations, real life experiences, discussion and role play. Although he proposes this strategy to help learners in developing their reading skill, certainly such activities could be applied in building efficient grammar knowledge because putting grammar into real life context can help learners to grasp the rules.

With regard to structure, the findings show that pupils do have many lacks at this level of language. It seems difficult for them to produce simple sentences respecting the right order of the basic elements of forming simple sentences: subject, verb, complement...etc. Let alone the use of more complex structures which are almost absent in their writings. The followings are samples of their own production: *(Earth satellite it is diameter…, the moon is an Earth satellite is oround orbit planet west to east direction…,in the moon No atmosphere and no water and composition rocky…*

Another remark on the pupils written production that should not be neglected throughout this analysis is the no correct use of the appropriate prepositions to link the different parts of speech i.e., pupils do not master the use of the convenient preposition in the required context and may be that's why there is a confusion between the use of "in " and "on" as in the case : **"***…life *in* the moon is…"* or between "to" and "from" as in the example : *"...and the closest body *from* it.."* or between " around" and "round" as in the case : *"…the moon revolves *round* the Earth…".*

### 3. 4.1.3 – Spelling

The pupils' written production is full of spelling mistakes( *satellites*, *resent  ristics,the solar system   resent many planets,..woter, earth satellite wich orbit…*  )They are confused with certain letters in the target language. Accordingly, it has been found that English spelling is often difficult because of the relationships between sounds and letter symbols which are less regular

than those in many other languages. (Kharma and Hajjaj 1997;Gorden 1998). The pupils do have problem in memorizing words correctly especially the scientific vocabulary items (misspelling words). Besides, due to their limited vocabulary, it is felt that learners are afraid of misspelling words that could impede their writing ability, the reason why they avoid using any term they doubt about.

### 3.4.1.4 – Vocabulary

Using the appropriate vocabulary in writing is another obstacle that faces pupils in their writing tasks, especially the scientific items which seem to be more and more difficult for the learners.

The data show that pupils are unable to express their ideas freely and accurately because of their limited vocabulary. They do not have sufficient scientific vocabulary to form meaningful sentences.(Al-Mutawa and Al-Kailani 1998) claim that learning vocabulary is a complex process which demands efficient and sufficient practice of form, meaning and usage.

It is obvious from their written production that pupils do not have enough experience of using scientific terms in their writings, that's why they sometimes use general terms which do not express the intended ideas and lead to incoherence and ambiguity as in the following example where one of the learners writes*"Yuri Gagarin went to the moon and he orbited the Earth."*

### 3.4.1.5 – Coherence

It seems to be absent in the pupils' writings as learners move from one idea to another without any logical order and sometimes, it is not easy to understand what pupils want to say because the elements of their written products are not well-bound, the reason why it is difficult to know what is being referred to and how the phrases and sentences relate to each other.( see appendix 3).

In fact, the correction of the written test reveals that learners use the cues given in the fact file to form independent sentences forgetting about sequencing information and presenting them in a way that readers can easily grasp what is meant. Besides, most of the pupils are unable to understand some cues in the fact file, particularly the scientific ones like: *Temperatures: sunlit side +110°C lunar nights – 170°C, Mass: 0,012(approximately one eighth) that of the earth, Surface gravity: only 0, 16.That's* why they jot down most of these cues as they appear in the fact file failing to transform them into ideas then into coherent sentences.

The problem of miss coherence in the pupils' writings is as serious as the other ones cited before. The results show that 40 % of the pupils under study are found to have this handicap. So as to convey their messages successfully to their readers, learners should organize and arrange their sentences and paragraphs systematically and logically.  (Mkude ,1980) reports that learners often fail to appreciate the value of organizing linguistic material strategically so as to secure maximal impact. Again, this weakness can be seen within and across sentences. Poor organization or illogical sequence may also be a result of poor teaching in schools. The problem could be reduced by effective teaching, the creation of a wider reading and writing habit, and involvement in discussions and debates.

### 3.4.2-Interpretation

As it has been already stated, the primary purpose of this writing test is to show whether or not pupils are able to write easily and successfully meaningful well-structured essays about science matters. However, the findings of the writing test indicate that the third year secondary school pupils are not competent if not weak in producing coherent and cohesive essays on scientific topics. The pupils' difficulty lies in many aspects of language starting from their inability to generate scientific ideas, moving to a spelling accuracy problem and a lack of scientific vocabulary items, then a difficulty to

apply grammar in writing and finally a tremendous incompetence of ensuring coherence in their written products. In short, using the correct language to tackle any scientific subject is one of the major pupils' deficiencies in writing.

## 3.5 – Conclusion

In this chapter, much emphasis is put on the pupils' and the teachers' perceptions towards the main difficulties that learners face when writing on scientific topics. This is revealed through submitting a questionnaire for third year secondary school pupils and another one for teachers. Besides, preparing a writing test for the same group of pupils serve so much for clarifying the reasons behind the pupils' reluctance in dealing with scientific matters.

The findings show that the pupils' difficulties in dealing with scientific subjects can be summarized into four main factors: The first one is related to the nature of the topics that pupils write about i.e., learners lack the necessary scientific knowledge and the ability to generate ideas to tackle this kind of subjects into a written form. The second factor, which is tightly linked to the mechanics of language, proves that pupils do not master grammar and structure. They do have problems with tenses and forming correct meaningful sentences in coherent well-structured paragraphs. Let alone their spelling difficulty and their poor scientific vocabulary.  With regard to the third factor, the results indicate that the teacher's writing instructions, his competence in applying effective strategies in writing and his right feedback towards his pupils' writing practice are considered as the foundation stone for any pupils' success in writing on scientific topics. Finally, the fear from writing on science matters and the lack of motivation and self confidence are the major psychological reasons that handicap learners in any written production.

Now and after presenting the main reasons behind the pupils' difficulties in writing on scientific topics, it is very useful to suggest some solutions to this problem so as to motivate learners to deal with this kind of subjects successfully and help teachers to apply certain strategies in the act of writing

process. This is, indeed, what is supposed to be tackled in the last chapter of this work.

# Chapter Four

# Solutions and Recommendations

**4.1-Introduction**

The last chapter of this investigation is devoted to suggest suitable solutions and recommendations to overcome the pupils' problems with scientific subjects in writing. So, what is coming next is an amount of personal suggestions and proposals in order to motivate learners to depict any scientific topic in writing and help teachers who seek assistance for teaching the writing skill competently.

To achieve this objective, more efforts and much work have to be done from the part of teachers who should encourage pupils to write on scientific topics. Indeed, teachers are responsible of developing the pupils' writing habits and the different mechanics of language such as: grammar, spelling, vocabulary, etc… This is on one hand, on other hand , teachers should receive regular training on teaching the writing skill so as to acquire new and efficient strategies to teach their pupils how to write competently. At the same time, the syllabus designer should take into account many factors that surround the learner and the teacher when setting any learning syllabus for the pupils. This is, in fact, the role of the ministry of education and all those who are responsible of the teaching field.

At the end of this chapter, it is preferable to suggest some efficient strategies of teaching writing on scientific subjects referring to the appropriate teacher's instructions, his competence in brainstorming and helping pupils to generate scientific ideas, and his feedback to his learners' writing attempts. These are, in brief, the most important points that are supposed to be tackled in a number of sections later on throughout this chapter.

**4.2 - Developing Pupils' Writing Habits**

Among the unsatisfactory results obtained throughout this research is that there are some pupils who have negative attitude to writing. They have anxieties about their ability to construct sentences and paragraphs in well-

structured essays. Those learners do not only fear the fact of dealing with scientific topics in writing, but they fear the act of writing on the whole and they may even rarely write in their own language.

According to Jeremy Harmer (2004) pupils who lack familiarity or confidence with writing need more time to build their writing habits. For him, there is a wide range of solutions to over come the problem. The most efficient one is to choose the writing tasks and activities that make pupils emotionally and intellectually satisfied; that's to say tasks which amuse them and make them feel good. This can be done through a variety of ways such as: using pictures, music, watching films, etc…Among the other techniques in developing pupils' writing habits, the followings are more useful.

- To be clear in information and task information (what do we want them to do?).
- To devote pair and group work among pupils and encourage collaborative writing.
- To help pupils with ideas, some patterns or schemes when they need assistance.
- To move gradually in writing tasks staring from Sentence writing, moving to paragraph writing and ending with essay writing.
- To motivate learners to read more scientific texts.

This is, more or less, how to train learners to develop their self-confidence and ability to write. However, developing pupils' writing habits alone can not solve the whole problem if the pupils' language in case of, vocabulary, grammar and spelling is not taken into consideration.

## 4.3 - Developing Mechanics of Language

Like all other skills, writing has its own mechanical components. These are considered as the nuts and bolts of any authentic peace of writing. So, it should be more than necessary to discuss of some of these mechanics of

language where much focus will be put on teaching scientific vocabulary to secondary school pupils as well as teaching spelling and grammar.

**4.3.1-Teaching Scientific Vocabulary**

Teaching learners vocabulary is one of the ways of acquiring a foreign language.So, it is very crucial to enable pupils to grasp and memorize as many vocabulary items as possible to engage in tackling any scientific topic or describing any scientific phenomenon .However, the fact of teaching vocabulary is not a matter of setting long bilingual lists of scientific vocabulary items as the traditional teaching methods used to do. It is rather a question of how to involve learners in realistic communicative situations where they feel able to use convenient scientific vocabulary needed for specific designed situations for writing.

Scholars and most language researchers agree that the possession of a sufficient stock of scientific vocabulary facilitates for learners the writing tasks and make them feel more self confident to treat any scientific subject.

In practice and in order to solve the pupils' lacks in scientific vocabulary, there are many successful ways of teaching vocabulary by using a number of techniques and a wide range of materials such as: pictures, graphic displays, scientific experiments, etc…. It is up to teachers to choose the suitable material that corresponds with the teaching input. If it is, for example, to describe the human digestive device it is preferable to use pictures and authentic materials to discuss the different organs of the device. If the matter deals with the increasing consumption of genetically modified foods among people, the learner should be asked to analyze and interpret results of data in a pie chart or a bar graph. The writing from various visual displays can help learners positively to interpret the data scientifically by using appropriate terminology and logical information. So, it is the learning situation which determines the register of the scientific terminology that should be taught to learners.

### 4.3.2- Teaching Grammar

No one can deny that effective writing is based on good syntax and correct arrangement of sentence elements (structure). A successful writer chooses correct words arranged into phrases and sentences to express appropriate relationships between ideas which are well-expressed when they are related to one another. However, relying only on syntax and structure to form sentences and build whole paragraphs is not satisfactory to ensure coherence and convey meanings without grammar and punctuation rules. Thus, applying grammatical rules in writing is efficient to overcome some of the pupils' difficulties in writing on scientific issues.

Teaching efficient grammar to secondary school pupils is a very important factor to enable them to write confidently. Thus, whatever grammar teaching is done, it should be presented as efficiently as possible. To ensure efficiency in teaching grammar, Scott Thornbury, in his book entitled: *How to Teach Grammar*," suggests 03 main factors that should be taken into account when teaching writing. These factors are: economy, ease and efficacy. With regard to economy, teachers have to be concise and economical in presenting grammar inputs in order to ensure motivation among learners, i.e. the shorter grammar is presented the better is grasped. Concerning the second factor, teachers should prepare easy examples to explain the grammatical points and avoid complicated activities to practise the rules of the input. Therefore, the easier an activity is to set up, the better it is. As far as efficacy is concerned, teachers can measure any progress of their pupils' learning through tests and exams which can provide feedback to teachers on the efficacy of learning teaching process. The efficacy of grammar activities can be, in turn, measured by the degree of the pupils' attention which means nothing if there is no understanding. Even the latter is ineffective without memory. So, pupils should pay attention, understand and memorize grammatical rules in order to use them in their writing attempts.

Another crucial point that should not be neglected in teaching grammar is appropriacy because learners are different in needs, interests, attitudes and even beliefs and values. According to Thornbury, there are some factors that should be considered when determining appropriacy.They are as follow:

- *Age of learners*
- *Their level*
- *The size of the group*
- *The constitution of the group, eg. monolingual or multilingual*
- *The learners' needs, eg. to pass* BAC exam
- *The learners 'interests*
- *The available materials and resources*
- *The learners' previous learning experience.*
- *Any cultural factors that might affect attitude. E.g. their perception of the role and status of the teacher.*
- *The educational context. E.g. private school or public school, at home or abroad.*

On the whole, teachers should bear in mind that teaching efficient grammar should be based on applying one of the two models: PPP model or Task-based model. In the former, language is learnt in steps starting from: presentation, practice and production. Here, Fluency develops out of accuracy and grammatical knowledge is acquired through practice. In the latter, language is learnt through communicative tasks and accuracy develops after fluency. Here, grammar is acquired through interaction and the syllabus objectives are expressed in relation with the real language use. So it is up to teachers to apply the convenient model to teach the different grammatical points taking into consideration the factors that have been already mentioned.

### 4.3.3- Teaching Spelling

One of the problems that face pupils in writing on scientific topics is spelling. English spelling is difficult because it is irregular i.e. the same

sounds can be spelt differently as in the words: *sea* and *see*. Sometimes, the same spelling can be pronounced differently ac in the words: *threw* and *sew*. However, the complexity of the English spelling and the existence of some conceptions do not mean at any rate the absence of certain clear spelling rules which facilitate memorizing words correctly. Here, it is the role of the teacher who should know how to teach spelling appropriately relying on certain efficient strategies to enable learners to acquire new scientific vocabulary items.

Teaching spelling starts by motivating learners to read extensively because reading helps learners to remember English spelling rules and their exceptions. In this respect, it should be noted that the teacher has to encourage his pupils to read more scientific texts since they belong to scientific stream. Teaching pupils word formation exercises and familiarizing them with spelling patterns through practice is another technique in teaching spelling.

Indeed, not only reading which may bring satisfactory results in learning how to spell English words correctly, but listening also contributes so much in making pupils more self-confident in writing correct English. Thus, listening to a series of words which share the same sound as in *got, bought, hot, dot* may be also useful to let learners identify how certain sounds are pronounced. In pronouncing words such as: *work, our, port, calm,* pupils will learn if certain sounds are pronounced or silent. This raises what J.Harmer (2004) calls awareness of convergence and divergence of sounds and their spellings.

The spelling of many words changes when they change their grammatical form. This can be taught to learners who should work out spelling rules through doing an exercise as the following one which is presented byJ.Harmer (2004).

*Look at the following verbs in the infinitive and with a verb ending. Can you say when the final letter of the verb is doubled and when it is not?*

| clap | clapping | limp | limping |
|------|----------|------|---------|
| commit | committed | pardon | pardoned |
| crawl | crawling | prefer | preferred |
| hint | hinted | run | running |
| hit | hitting | sin | sinned |
| howl | howled | sing | singing |
| knit | knitted | sit | sitting |

As a comment on this proposed exercise, learners need more concentration to come upon the three "doubling rules». This exercise also makes it clear for the pupils that English spelling is not random. Last but not least, encouraging pupils to use dictionaries to check the spelling of words and devoting some dictating sessions are considered as excellent techniques for spelling practice. Therefore, teachers had better try these techniques with their learners.

### 4.3.4- Teaching Punctuation and Capitalization

The findings of the present work indicate that learners are not able to use punctuation and capitalization correctly and appropriately. The writing test shows that most of the pupils know no more than two punctuation marks which are: the full stop and the comma. This is, indeed, a tremendous handicap for them to achieve any development in their writing attempts. How can a pupil produce a coherent paragraph or a well-organized essay if he does not how and when to use the convenient punctuation mark and the appropriate capital letter where necessary?

To enable learners to use capitalization and punctuation correctly, a huge work and much effort should be done from the part of teachers who are responsible of training pupils about that. Therefore, pupils should be taught that the main objective from inserting punctuation marks in any peace of writing is to enable the reader to understand what a writer means. They have

to know that any variation in punctuation may lead to a great difference in meaning. For example, the following sentences can never mean the same due to the variation of the punctuation marks. "He is angry." "He is angry?" "He is angry!" The three sentences convey different meanings due to different punctuation marks. With regard to capitalization, most of the pupils recognize that capital letters are used to announce to the reader the beginning of a new sentence. However, in practice very few pupils who use capitalization in titles, proper names, days, months, holiday seasons, etc. On one hand, they ignore the right use of capitalization, the reason why they insert capital letters randomly and unconsciously. On other hand, they don't get sufficient practice about the use of capitalization in their writings.

All in all, learners can learn to punctuate and capitalize through:

- Writing whole texts on the board without punctuation and capitalization, and then asking learners to punctuate and capitalize.

- Teaching punctuation and capitalization through preparing a rules chart.

- Dictating unpunctuated passages.

- Allowing peer correction before correcting pupils' products.

**4.4- Training Teachers to Teach Writing Skill**

Teachers should benefit from training sessions in which they receive a basic formation of how to teach writing skill. This can be done by teacher trainers or educationalists who have sufficient knowledge and enough experience in the field of teaching.

Theoretical work alone may not solve the problem if there is no real practice of teaching writing.Therfore, it is very crucial to train teachers how to proceed practically to motivate learners to write. For instance, they should be taught about the different stages of writing process starting from planning stage and moving to drafting, revising, editing, proofreading and finishing by

representing written products. Training teachers of the different principles and characteristics of each stage may enable them to involve their learners in the writing process effectively.

Teachers should be also trained of how to teach the different types of writing to their pupils. How can they ask their learners to argue a point of view about a scientific phenomenon if they ignore using the appropriate strategy to encourage pupils to give opinions, agree politely or disagree strongly with others who may not share the same point of view?

It is also important to train teachers how to apply the new teaching approach" Competency-based approach in writing because, according to the obtained results of the investigation, many teachers complain about the ignorance of the real practical use of this approach in teaching. They should know that the purpose from applying the Competency-based Approach in the Algerian secondary school is to establish three main competencies in the learners: First, to ensure oral interaction in English. Second, to interpret authentic oral or written documents. Third, to encourage learners to produce oral or written messages.

Generally speaking, teachers should be trained of how to develop communicative skills in learners so as to enable them use English to express themselves freely and make themselves well- understood. The approach aims at the establishment of a know-how-to-do and know-how-to-be in learners.

**4.5 – Designing Convenient Learning Syllabus.**

Teachers are not the only unique factor to be blamed for the failure of pupils to write on scientific topics, but a part of responsibility should be also put on those who are charged of designing secondary school syllabus. The findings of this study indicate that one of the reasons behind the teachers' obstacles in teaching writing appropriately is the application of the syllabus which does not allow them to develop their pupils' writing abilities efficiently. This is due to its length and the absence of a clear strategy in teaching writing

skill. This is in one hand, in other hand teachers protest that they are not given opportunity to participate and suggest what they think is fruitful and useful for their learners. Therefore, and for the sake of preparing suitable English programme for secondary school level, teachers should be involved in designing any learning syllabus since they are considered as the first to be aware of the pupils lacks in learning language. Their participation in setting their learners' programmes contribute, undoubtedly, in overcoming the shortcomings that any learning syllabus may include. Not far from this context, professor Miliani (2003) points out:

> *" The political and / or educational authorities may intervene to impose their say in the selection of one or several methods. But the final decision is the teacher's who is closer to reality since he works regularly with his students, and should, after a while, have all the information about his students, which is needed to guarantee the success of the course."*

To design a convenient learning syllabus, the secondary school writing programme should determine clear learning goals which help learners to focus on how to engage in successful writing activities about whatever scientific topics.

Textbooks should be also taken into consideration when setting the learning syllabus. They should be developed to incorporate a variety of authentic contextualized materials and topics, including more scientific subjects so as to satisfy the needs of learners in case of scientific culture which is needed when they are asked to write about scientific matters. Equal attention should be given to the teaching of different mechanics of language (vocabulary, spelling, grammar, etc...).

Another important element that should not be neglected when designing the syllabus is reading which should be given more emphasis in order to stimulate pupils'imagination. This can be done through devoting appropriate scientific texts on diverse topics and motivate learners to read more so as to

write well. It is through extensive reading that pupils gain a sufficient lexical luggage which is needed for any writing attempt.

To end with, one should say objectively that a large number of writing problems are pedagogical in nature. The failure of many pupils to write on scientific topics implies a failure of the school and the educational system at large. It is the role of the school to develop and extend the skills of the pupils' academic writing. Likewise, it is the responsibility of the curriculum developers, in conjunction with the Ministry of Education, to carry out regular evaluations of the pupils' writing abilities and teaching methodology to check whether they reflect the stated language objectives.

## 4.6- Teaching Efficient Writing Strategies

Teaching writing skill is quietly different from teaching the other skills. The matter becomes more arduous when teaching pupils how to write on science topics. It requires from the part of the teacher enough knowledge on science topics and sufficient awareness about the efficient strategies of teaching writing because, "*... teaching the type of writing we get students to do will depend on their age, interests and level.*"J. Harmer (2001).

When setting tasks for pupils, teachers make sure that their learners have or can get enough knowledge to complete the task. A good teacher is the one who never leads his learners towards failure when asking them to write. Therefore, teachers bear a big responsibility in teaching writing appropriately and providing learners with efficient strategies to be good successful writers. This is, indeed, what is supposed to be tackled in the following section which sheds much light on the teacher's role in teaching writing for secondary school pupils.

### 4.6.1 - The Teacher's Writing Instructions

In school, teachers are needed to give clear instructions when asking pupils to write, particularly when they are wanted to write on specific topics

like scientific ones. In fact, there are two general rules for giving instructions according to J.Harmer (2001) *"...They must be kept as simple as possible and they must be logical."* Teachers should set clear objectives when demanding from learners to start writing on a given topic. When they give instructions, it is important for them to check that pupils have understood what they are being asked to do. To realise that succefully, teachers often ask one of the pupils to explain the activity after the teacher has given the instruction or by getting some one to the other pupils in the class how the exercise works.J.Harmer (2001).

In fact, teachers have to make clear for their learners many important points before starting any writing task. They have to clarify the intended objectives from the suggested writing activities as well as the type of writing they use and the audience to whom they write. Since otherwise, pupils find themselves write randomly and ambiguously.

## 4.6.2 - Brainstorming

It is the initial stage in any writing process. Without it, the writing tasks become more difficult if not impossible. It is, simply, a tool used by teachers to bring out the ideas of learners and expand their thinking to include all aspects of a problem or a situation.Teachers play a major role in motivating learners to write on scientific topics and supplying them with sufficient background knowledge on the topics they are supposed to depict. They are responsible for stating the topic to be brainstormed in the form of a question and making sure that every body understands the writing task. It is in this step that learners are asked to generate ideas and gather information and thoughts about the topic meant for writing. They are supposed to produce a large number of ideas and contribute personally to develop their sense of ownership. At this level, a kind of collaborative work emerges between the teacher and his learners who react either positively or negatively towards the writing subject.

In fact, a successful brainstorming is achieved when a number of rules are respected. Most of these rules are as follow:

- Active participation by all the learners.
- No discussion, criticism or comments during the brainstorm.
- Setting a time limit for the brainstorm.
- Clarifying ideas for the learners and not making judgements about them.
- Combining ideas which seem similar.

In secondary school, teachers are required to brainstorm the topics designed for writing for their learners before any writing attempt. They can use a wide range of techniques such as: pictures, maps, graphic displays and real objects to encourage pupils to jot down ideas and benefit from their background knowledge in expressing their thoughts and defending their points of view independently. Practically, teachers ask their pupils to give ideas after allowing them for a few minutes to think about the question or the topic designed for writing. They do not display the ideas on the board until they make sure they have collected every one's ideas so as to give chance to all learners to participate. In this stage of writing, the teacher's role is no more than motivating, guiding and clarifying what seems ambiguous for the pupils.

### 4.6.3 - Generating Scientific Ideas

Teaching learners how to generate ideas should result from many experiences and oral discussions in class through listening to music, acting plays, practising speeches, discussing works of art, examining pictures, view films and reading materials in different fields. It is also a result of listening to talks and lectures by guest speakers.

The fact of teaching learners scientific issues in different domains of science such as: biology, geology, chemistry and so on lead them to acquire some scientific vocabulary which can be necessary and form the starting point of any attempt in writing about a scientific subject. So, the fact of supplying

pupils with new scientific thoughts largely depends on providing them with the appropriate mechanism of thinking, analyzing and interpreting. It is through living and practising some scientific phenomena that learners feel able to write about and translate the scientific situation into words, sentences, paragraphs and why not whole essays.

Another efficient way of generating ideas is to communicate with people. Not far from this context, Weisberg (2006) points out that listening and speaking to people may provide input for helping pupils to write. However, not only listening and speaking which may serve for better writing, reading can also play a major role in providing pupils with a large amount of ideas and thoughts. In this respect, many language researchers agree that reading and writing complement each other as skills, thinking processes and as ways of learning (Gordon, 2008) the reason why it is very crucial to read more so as to write well.

Eisterhold's (1991), and Gordon's (2008) claim that reading provides a necessary input for writing and provides vocabulary and main models (formal schematas) from which writing skills can be learned. Consequently, the integration of skills is important because it allows the learner to link all skills together and be fluent and accurate at the same time

## 4.6.4- Writing Practice

Secondary school pupils, particularly those of scientific stream, need more assistance from their teachers to practise writing on scientific topics appropriately. Their need in writing skill does not only concern the scientific way of writing but it also touches the general writing exercises. This means that pupils feel the need for more practice of the different mechanics of language such as : grammar, spelling, vocabulary...etc.There are also pupils who think that scientific writing is different from general writing and it might be difficult for them to grasp how to write scientifically and become aware of the scientific genre .

To satisfy these needs, teachers have to devote much time for writing practice to give their learners enough opportunities to write about different subjects in various situations. They can achieve this objective throughout the sessions of: Think Pair, Share, Research and Report, Say it in Writing and especially in Writing Development where learners use all that has been learnt during the whole unit and transform their knowledge into short essays. For Rivers and Temperly (1978):

> *"Practice is needed in actual sequential writing. Having learned about the various part of the machine and parts of the parts, and how these synchronize in action the students need to set the machine in motion with different parts active in weaving the intricate pattern of meaning. Here guidance is helpful in learning which parts will operate together to form new patterns. Students' aptitudes vary widely in writing. Some need considerable help in developing a smooth and effective operation, others seem intuitively to take off and create interesting patterns of their own".*

At the end, and since they belong to the scientific stream, pupils should be encouraged and trained to write using scientific genre. To achieve this objective, they have to read more in their scientific area and be more familiar with scientific style. At the same time, they are required to master the basic skills of writing so as to understand the scientific genre. This is, indeed, the role of the teacher who is supposed to respond positively towards his learners' written products and motivate pupils to deal more and more with scientific topics.

### 4.6.5 – Responding to Pupils' Writings

During any writing process, pupils expect assistance and feedback from their teachers to see how well they progress in their writing attempts. It is through feedback that teachers make evaluations and give comments on their pupils' written products. However, the kind of feedback provided by teachers affects either positively or negatively the pupils' attitude towards the act of writing. For example, a teacher who provides a negative feedback towards his

pupils' attempts in their written products creates a frustration among pupils who feel unable to produce any piece of writing. However, the positive one is much more likely to motivate them to write about whatever topics suggested for writing. Therefore, teachers should motivate learners and provide assistance with brainstorming and organizing, reviewing and exploring the extent of content information available.

In practice , the teacher's feedback starts with pupil's first draft in response to his way of organizing information and the general features of his writing ( grammar, spelling, vocabulary, coherence, etc…).It should be noted that the teacher's feedback should not only concern pupils as individual writers but it may also touch pupils working in pairs or groups. At the same time, teachers have to decide which feedback they have to give to their pupils' writings; whether it is instructional or evaluative feedback. The former means giving instructions to the learners as a response to some possible shortcomings in the pupils'pruducts in order to overcome these deficiencies whereas the latter deals with the evaluative assessment to the pupils' final drafts. On the whole, teachers should be aware about when, where and how to intervene so as to encourage their learners to progress and not vice versa.

With regard to the pupils' error correction, teachers should take this point into account too since it deals with the affective state of pupils who fear making mistakes. Indeed, the fear from making mistakes prevents learners from being receptive and responsive. Therefore, responding positively towards pupils' errors may help them to overcome their fear and facilitate the process of learning. In fact, pupils usually wait for teachers' feedback towards their products and particularly their possible mistakes on any kind of production to know where they are wrong. Here, teachers should correct their pupils' English and draw their attention to some language problems. First, they are needed to inform learners about their mistakes. Second, they have to help them to detect and correct their written products themselves. In case they could not,

teachers should allow pupil-pupil correction. It is only when the pupils fail to find solutions to their language problems that teachers can intervene and correct their learners' mistakes.

## 4.7- Conclusion

Chapter four, which is the last part of inquiry, is devoted to suggest some convenient solutions to the pupils' problem with writing on scientific topics. As it has already been mentioned, the pupils' difficulties lie in a number of reasons which are interrelated and can not be treated separately. Thus, proposing any remedial work to overcome the problem is based on the final results obtained in the investigation .Therefore, and as a matter of fact, the findings indicate that there are four main factors which make third year secondary school pupils unable to treat scientific topics in their writings.

The first factor has to deal with the pupils themselves who lack the necessary scientific knowledge and the ability to generate ideas about scientific subjects. The suggested solution to this difficulty is to provide learners with efficient learning strategies in order to enrich their lexical stock with sufficient scientific culture which is needed to depict any science matter in writing.

The second reason is related to the teacher who does not motivate learners to write about scientific issues. He does not play his role in providing his pupils with the right feedback in their writing attempts. This is due to the lack of training sessions and the ignorance of applying CBA; the new teaching approach in writing. To solve this problem, teachers should receive regular training about how to teach writing skill and how to benefit from the principles of the new teaching approach. They should be also involved in designing their pupils' syllabus and why not contribute in drawing the general educational policy in teaching.

Concerning the third reason, the pupils' difficulty is in the use of the different mechanics of language in writing as in the case of grammar, vocabulary, spelling, punctuation and capitalization, coherence etc… To solve the problem, much emphasis has to be made on teaching these aspects through submitting efficient strategies and a well-determined methodology of teaching writing.

Finally, the pupils' fear and their lack of motivation to deal with scientific topics can be solved through developing their writing habits and satisfying their interests by choosing the writing tasks which amuse them and make them emotionally and intellectually satisfied i.e., being aware of the variety of tastes and interests that pupils have.

**General Conclusion**

The study aims at revealing the main reasons of the pupils' difficulties in writing on scientific topics. The reality shows that third year secondary school pupils, scientific stream are unable to engage in writing coherent science essays in spite of spending more than five years learning English as a foreign language. They find it quite difficult to treat any scientific subject in a written form. Certainly, there are concrete reasons behind this weakness.

Generally speaking, after testing the hypotheses through questionnaires and a writing test, the findings indicate that the major reasons behind the pupils' reluctance in writing on scientific issues can be classified as follow: The first reason deals with the scientific knowledge; that's to say pupils are not able to generate ideas on scientific issues. They find it difficult to think in English and rely on themselves to write independently, the reason why, they always need guidance from their teachers who, most of time, ignore how to provide them with efficient techniques and appropriate strategies in teaching writing skill. The second reason concerns the language itself i.e. pupils face difficulties in the different mechanics of writing starting from applying grammatical rules correctly in their written production , using appropriate vocabulary items, respecting punctuation and capitalization norms and spelling correct English words. The third factor is related to the teacher's role in teaching writing skill and dealing with scientific topics in particular. Here, the findings indicate that teachers do not play their major role in motivating learners to tackle scientific matters in their writing. This is due to the insufficient training sessions they receive and the absence of a clear strategy in teaching writing. The last factor is related to the learner himself who is, most of the time, not ready to write because of the lack of motivation, the absence of self-confidence and the fear that haunts him when asked to write on science. Therefore, the hypotheses raised for the present work are confirmed, and it is obvious that the factors behind the learners' reluctance in writing on scientific

topics are interrelated and can not be separated, the reason why the pupils' poor production in writing is a reality that should be taken into account.

Taking all these factors into consideration and for the sake of solving the problem, whole hosts of teaching writing strategies are suggested and a wide number of efficient learning techniques are proposed. Among them, learners ought to read more scientific texts and develop their scientific culture. They have to expose themselves to different writing situations and produce coherent paragraphs in well-organized essays. They are also required to engage into extensive writing tasks in order to improve their style and gain enough confidence in building their writing habits. With regard to teachers, they are responsible for developing the pupils' mechanics of writing, especially grammar, spelling and punctuation. They should also devote more writing practice about scientific matters and motivate their learners to engage into successful writing attempts. At the level of pedagogy, teachers should receive more training sessions about how to teach writing skill competently. They ought to know and apply the latest fruitful teaching methods and the most appropriate techniques in teaching writing. Finally, designing a convenient learning syllabus for the pupils and determining clear learning goals are important factors that should be taken into account to obtain satisfactory results.

It is through such analysis that an awareness of writing needs can be brought to light. Pupils' writing problems, syllabus, activities, materials, pedagogy and exams are examined to give a clear picture of the writing situation. This is on one hand, on other hand; the findings of the current study may help the curriculum developers to improve the current syllabus of third year secondary school pupils in a way that could meet their needs and wants.

At the end and so as to be objective in this study, the third year pupils of Belhadj Abdelhadi Charef Ain Merane secondary school and their teachers are no more than a sample taken at a random from one of the Algerian secondary

schools .Although the findings of this investigation confirm all the hypotheses raised previously about the pupils reasons behind their reluctance to write on scientific topics, the subject matter still remains open for discussion and research especially in a country like Algeria, which is known by its socio-cultural diversity, and where the ability of learning foreign languages is different from one region to another.

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- http://onlinesciencedegrees.net/Wednesday,January20,2010at 10:00AM

**Appendix N° 01**

## Questionnaire (1) / Pupils

You are kindly invited to answer the following questionnaire .Your contribution is kept anonymous and used only for research purpose. Your opinions and answers will certainly serve for better understand the reasons of the pupils' difficulties in writing on scientific topics.

Please put (x) in the appropriate space.

**Sex :**

- Male ☐

- Female ☐

**Branch :** Scientific Stream

**1-Learning Skills :**

Of the four major skills, which are the most important ones for success in English learning according to you ?

Speaking ☐
Writing ☐
Reading ☐
Listening ☐

| **2- Writing on Scientific Topics:** | **Yes** | **No** | **sometimes** |
|---|---|---|---|
| **-** Do you like writing on scientific topics  ? | ☐ | ☐ | ☐ |
| - Do you prefer writing on literary topics instead ? | ☐ | ☐ | ☐ |
| - Do you find it difficult to generate ideas on scientific subjects? | ☐ | ☐ | ☐ |
| - Is it difficult for you to understand scientific vocabulary when you write? | ☐ | ☐ | ☐ |
| - Do you listen to  your teacher when giving instructions about the topics designed for writing  ? | ☐ | ☐ | ☐ |
| - Do you have enough time to think before writing? | ☐ | ☐ | ☐ |

**3- The Teacher's Role:**

| | | | |
|---|---|---|---|
| - Does your teacher warm up the topics of written expression? | ☐ | ☐ | ☐ |
| - Does he explain the scientific vocabulary | ☐ | ☐ | ☐ |

items of the topics designed for writing ?

-Does he provide clear instructions when
  writing on scientific topics ?

- Does he  allow for sufficient practice in

  the use of punctuation ?

- Does he provide sufficient practice in

  developing the grammatical part of writing ?

- Does he provide sufficient practice

   in spelling ?

- Does he correct your  written

  production ?

- Does he shout on you when you make mistakes

   in writing ?

- Does he provide feedback on

   the writing home work ?

-Does he provide extra help for

  weak students in writing ?

## 4 –The Difficulty in the Language Itself:

What are your problems with writing on scientific matters?
Please tick (√ ) one box for each statement

| Investigated points | never | sometimes | always |
|---|---|---|---|
| Using appropriate scientific vocabulary | | | |
| Applying grammatical rules in writing | | | |
| Expressing ideas in writing | | | |
| Using correct punctuation | | | |
| Using correct spelling | | | |
| Understanding writing instructions about scientific topics | | | |
| Forming sentences | | | |
| Establishing cohesion in writing | | | |

## 5- Psychological Problems

What psychological problems do you face when writing on scientific topics ?

-               Fear and anxiety

-               Lack of confidence

-               Lack of motivation

-               No psychological problem

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**Appendix N° 02**

## Questionnaire ( 2 ) / Teachers

You are kindly invited to answer the following questionnaire .Your contribution is kept anonymous and used only for research purpose. Your opinions and answers will certainly serve for better understand the reasons of the pupils' difficulties in writing on scientific topics.

Please put (x) in the appropriate space.

**1-Learning Skills :**

Which one of the four skills does the third year secondary school syllabus give much importance ?

|  |  |
|---|---|
| Reading | ☐ |
| Speaking | ☐ |
| Writing | ☐ |
| Listening | ☐ |

**2 - Pedagogy** :

|  | Yes | No | sometimes |
|---|---|---|---|
| - Does the programme of English fit the pupils' levels ? | ☐ | ☐ | ☐ |
| - Does the syllabus designer allow you use your own teaching strategies ? | ☐ | ☐ | ☐ |
| -Do you receive any regular training in teaching writing skill? | ☐ | ☐ | ☐ |
| -Do you think the training you made at the university was sufficient to teach ? | ☐ | ☐ | ☐ |

**3- Writing on Scientific Topics:**

Writing on scientific subjects is difficult because of :

|  | | | |
|---|---|---|---|
| - The text-book in use | ☐ | ☐ | ☐ |
| - The approach and the techniques use | ☐ | ☐ | ☐ |
| - The learners' lack of motivation | ☐ | ☐ | ☐ |
| - The teacher's classroom methodology | ☐ | ☐ | ☐ |

**4 - The Teacher's Role**

|  | | | |
|---|---|---|---|
| - Do you encourage your pupils to write on scientific topics ? | ☐ | ☐ | ☐ |
| - Do you explain the scientific vocabulary | ☐ | ☐ | ☐ |

items of the topics designed for writing?

- Do you provide clear instructions when
  writing on scientific topics ? □ □ □

- Do you provide sufficient practice in
  developing the grammatical part of writing ? □ □ □

- Do you provide sufficient practice
  in spelling ? □ □ □

- Do you allow for sufficient practice in
  the use of punctuation ? □ □ □

- Do you evaluate your pupils' written
  production ? □ □ □

- Do you give feedback to your pupils on their
  writing attempts ? □ □ □

## 5 - Pupils' Psychology :

- Do your pupils fear the act of writing
  on scientific matters ? □ □ □

- Is there any humour in teaching the lesson of writing ? □ □ □

- Do you shout on your pupils when making
  written mistakes ? □ □ □

- Do you let them correct themselves when making mistakes ? □ □ □

- Do you praise your pupils when making progress
  in writing ? □ □ □

## 6 - Any Other Comment

……………………………………………………………………………………

……………………………………………………………………………………

……………………………………………………………………………………

……………………………………………………………………………………

………………………………………………………

**Appendix N° 03**

**Pupils' Writing Test**

**Tool:** Testing

**Population**: 3AS/Scientific stream

**Skill to be tested**: Writing

**Objective**:  **Revealing pupils' difficulties in writing on scientific topics.**

**Topic:** Class presentation about the Moon.

**Procedure**:

**1/-** Write an expository presentation of the Moon using the notes in the fact file below. Include any other details you think appropriate.

**Fact file**

Earth satellite. Diameter: 3,476 km. Mass: 0,012 (approximately one eighth) that of the earth. Surface gravity: only 0, 16 (one-sixth) that of Earth. Average distance from Earth: 384,400 km. Orbit: west-to-east direction. No atmosphere and no water. Temperatures: sunlit side +110°C lunar nights - 170°C. Composition: rocky. Age: 4,6 billion years. Orbits in a west-to-east direction every 27, 32 days _____

**2/-** You may conclude with a reminder about man's attempt to explore the moon.

**3/-** Draft revision checklist:

- Are the tenses used appropriately?
- Are the sentence structures varied and appropriate for the expression of measurement, size, distance, E.g. It has a diameter / of_with_.Its diameter is__.
- Are the link words used appropriately? E.g. As to_, in connection with_, As far as_is concerned, Concerning__?

**4/-** Write a final version of your presentation .Then read it aloud to the class.

**Note:**  It should be noted that the chosen topic is taken from the 3 rd year secondary school /scientific stream syllabus.

**Appendix N° 04**

**Samples of pupils' questionnaire**

**Pupil**…..

You are kindly invited to answer the following questionnaire .Your contribution is kept anonymous and used only for research purpose. Your opinions and answers will certainly serve for better understand the reasons of the pupils' difficulties in writing on scientific topics.

Please put (x) in the appropriate space.

**Sex :**
- Male ☐
- Female ☐
**Branch :** Scientific Stream

**1-Learning Skills :**

Of the four major skills, which are the most important ones for success in English learning according to you ?

Speaking ☐
Writing ☐
Reading ☐
Listening ☐

| **2- Writing on Scientific Topics:** | **Yes** | **No** | **sometimes** |
|---|---|---|---|
| - Do you like writing on scientific topics ? | ☐ | ☐ | ☐ |
| - Do you prefer writing on literary topics instead ? | ☐ | ☐ | ☐ |
| - Do you find it difficult to generate ideas on scientific subjects? | ☐ | ☐ | ☐ |
| - Is it difficult for you to understand scientific vocabulary when you write? | ☐ | ☐ | ☐ |
| - Do you listen to your teacher when giving instructions about the topics designed for writing ? | ☐ | ☐ | ☐ |
| - Do you have enough time to think before writing? | ☐ | ☐ | ☐ |

**3- The Teacher's Role:**

| | | | |
|---|---|---|---|
| - Does your teacher warm up the topics of written expression? | ☐ | ☐ | ☐ |
| - Does he explain the scientific vocabulary | ☐ | ☐ | ☐ |

items of the topics designed for writing ?

-Does he provide clear instructions when
  writing on scientific topics ?

- Does he allow for sufficient practice in

  the use of punctuation ?

- Does he provide sufficient practice in

  developing the grammatical part of writing ?

- Does he provide sufficient practice

  in spelling ?

- Does he correct your written

  production ?

- Does he shout on you when you make mistakes

  in writing ?

- Does he provide feedback on

  the writing home work ?

-Does he provide extra help for

  weak students in writing ?

## 4 –The Difficulty in the Language Itself:

What are your problems with writing on scientific matters?

Please tick (√ ) one box for each statement

| Investigated points | never | sometimes | always |
|---|---|---|---|
| Using appropriate scientific vocabulary | | | |
| Applying grammatical rules in writing | | | |
| Expressing ideas in writing | | | |
| Using correct punctuation | | | |
| Using correct spelling | | | |
| Understanding writing instructions about scientific topics | | | |
| Forming sentences | | | |
| Establishing cohesion in writing | | | |

## 5- Psychological Problems

What psychological problems do you face when writing on scientific topics ?

-        Fear and anxiety

-        Lack of confidence

-        Lack of motivation

-        No psychological problem

# Samples of pupils' questionnaire

## Pupil…..

You are kindly invited to answer the following questionnaire .Your contribution is kept anonymous and used only for research purpose. Your opinions and answers will certainly serve for better understand the reasons of the pupils' difficulties in writing on scientific topics.

Please put (x) in the appropriate space.

**Sex :**
- Male ☐
- Female ☐

**Branch :** Scientific Stream

### 1-Learning Skills :

Of the four major skills, which are the most important ones for success in English learning according to you ?

Speaking ☐
Writing ☐
Reading ☐
Listening ☐

### 2- Writing on Scientific Topics:

|  | Yes | No | sometimes |
|---|---|---|---|
| - Do you like writing on scientific topics ? | ☐ | ☐ | ☐ |
| - Do you prefer writing on literary topics instead ? | ☐ | ☐ | ☐ |
| - Do you find it difficult to generate ideas on scientific subjects? | ☐ | ☐ | ☐ |
| - Is it difficult for you to understand scientific vocabulary when you write? | ☐ | ☐ | ☐ |
| - Do you listen to your teacher when giving instructions about the topics designed for writing ? | ☐ | ☐ | ☐ |
| - Do you have enough time to think before writing? | ☐ | ☐ | ☐ |

### 3- The Teacher's Role:

| | Yes | No | sometimes |
|---|---|---|---|
| - Does your teacher warm up the topics of written expression? | ☐ | ☐ | ☐ |
| - Does he explain the scientific vocabulary items of the topics designed for writing ? | ☐ | ☐ | ☐ |
| | ☐ | ☐ | ☐ |

-Does he provide clear instructions when
  writing on scientific topics ?

- Does he  allow for sufficient practice in        ☐   ☐   ☐

   the use of punctuation ?

- Does he provide sufficient practice in            ☐   ☐   ☐

  developing the grammatical part of writing ?

- Does he provide sufficient practice              ☐   ☐   ☐

   in spelling ?

- Does he correct your  written                    ☐   ☐   ☐

  production ?

- Does he shout on you when you make mistakes       ☐   ☐   ☐

   in writing ?

- Does he provide feedback on                       ☐   ☐   ☐

   the writing home work ?

-Does he provide extra help for                     ☐   ☐   ☐

  weak students in writing ?

**4 –The Difficulty in the Language Itself:**
 What are your problems with writing on scientific matters?
 Please tick (√ ) one box for each statement

| Investigated points | never | sometimes | always |
|---|---|---|---|
| Using appropriate scientific vocabulary | | | |
| Applying grammatical rules in writing | | | |
| Expressing ideas in writing | | | |
| Using correct punctuation | | | |
| Using correct spelling | | | |
| Understanding writing instructions about scientific topics | | | |
| Forming sentences | | | |
| Establishing cohesion in writing | | | |

**5- Psychological Problems**

 What psychological problems do you face when writing on scientific topics ?

-               Fear and anxiety              ☐

-               Lack of confidence            ☐

-               Lack of motivation            ☐

-               No psychological problem      ☐

**Appendix N °05**

**Samples of teachers' questionnaire**

**Teacher**…..

You are kindly invited to answer the following questionnaire .Your contribution is kept anonymous and used only for research purpose. Your opinions and answers will certainly serve for better understand the reasons of the pupils' difficulties in writing on scientific topics.

Please put (x) in the appropriate space.

**1-Learning Skills :**

Which one of the four skills does the third year secondary school syllabus give much importance ?

| | |
|---|---|
| Reading | ☐ |
| Speaking | ☐ |
| Writing | ☐ |
| Listening | ☐ |

**2 - Pedagogy** :

| | Yes | No | sometimes |
|---|---|---|---|
| - Does the programme of English fit the pupils' levels ? | ☐ | ☐ | ☐ |
| - Does the syllabus designer allow you use your own teaching strategies ? | ☐ | ☐ | ☐ |
| -Do you receive any regular training in teaching writing skill? | ☐ | ☐ | ☐ |
| -Do you think the training you made at the university was sufficient to teach ? | ☐ | ☐ | ☐ |

**3- Writing on Scientific Topics:**

Writing on scientific subjects is difficult because of :

| | | | |
|---|---|---|---|
| - The text-book in use | ☐ | ☐ | ☐ |
| - The approach and the techniques use | ☐ | ☐ | ☐ |
| - The  learners' lack of motivation | ☐ | ☐ | ☐ |
| - The teacher's classroom methodology | ☐ | ☐ | ☐ |

**4 - The Teacher's Role**

| | | | |
|---|---|---|---|
| - Do you encourage your pupils to write on scientific topics ? | ☐ | ☐ | ☐ |

- Do you explain the scientific vocabulary □ □ □

   items of the topics designed for writing?

- Do you provide clear instructions when □ □ □
   writing on scientific topics ?

- Do you provide sufficient practice in □ □ □

   developing the grammatical part of writing ?

- Do you provide sufficient practice □ □ □

   in spelling ?

- Do you  allow for sufficient practice in □ □ □

   the use of punctuation ?

- Do you evaluate your  pupils' written □ □ □

   production ?

- Do you give feedback to your pupils on their □ □ □

   writing attempts ?

## 5 - Pupils' Psychology :

- Do your pupils fear the act of writing □ □ □

   on scientific matters ?

- Is there any humour in teaching the lesson of writing ? □ □ □

- Do you  shout on your pupils when making □ □ □

   written mistakes ?

- Do you let them correct themselves when making mistakes ? □ □ □

- Do you praise your pupils when making progress □ □ □

   in writing ?

## 6 - Any Other Comment

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<p align="center">**Samples of teachers' questionnaire**</p>

<p align="center">**Teacher**…..</p>

You are kindly invited to answer the following questionnaire .Your contribution is kept anonymous and used only for research purpose. Your opinions and answers will certainly serve for better understand the reasons of the pupils' difficulties in writing on scientific topics.

Please put (x) in the appropriate space.

## 1-Learning Skills :

Which one of the four skills does the third year secondary school syllabus give much importance ?

| | |
|---|---|
| Reading | ☐ |
| Speaking | ☐ |
| Writing | ☐ |
| Listening | ☐ |

## 2 - Pedagogy :

| | Yes | No | sometimes |
|---|---|---|---|
| - Does the programme of English fit the pupils' levels ? | ☐ | ☐ | ☐ |
| - Does the syllabus designer allow you use your own teaching strategies ? | ☐ | ☐ | ☐ |
| -Do you receive any regular training in teaching writing skill? | ☐ | ☐ | ☐ |
| -Do you think the training you made at the university was sufficient to teach ? | ☐ | ☐ | ☐ |

## 3- Writing on Scientific Topics:

Writing on scientific subjects is difficult because of :

| | | | |
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| - The text-book in use | ☐ | ☐ | ☐ |
| - The approach and the techniques use | ☐ | ☐ | ☐ |
| - The learners' lack of motivation | ☐ | ☐ | ☐ |
| - The teacher's classroom methodology | ☐ | ☐ | ☐ |

## 4 - The Teacher's Role

| | | | |
|---|---|---|---|
| - Do you encourage your pupils to write on scientific topics ? | ☐ | ☐ | ☐ |
| - Do you explain the scientific vocabulary | ☐ | ☐ | ☐ |

items of the topics designed for writing?

- Do you provide clear instructions when
  writing on scientific topics ?   ☐ ☐ ☐
- Do you provide sufficient practice in   ☐ ☐ ☐

  developing the grammatical part of writing ?

- Do you provide sufficient practice   ☐ ☐ ☐

  in spelling ?

- Do you  allow for sufficient practice in   ☐ ☐ ☐

  the use of punctuation ?

- Do you evaluate your  pupils' written   ☐ ☐ ☐

  production ?

- Do you give feedback to your pupils on their   ☐ ☐ ☐

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## 5 - Pupils' Psychology :

- Do your pupils fear the act of writing   ☐ ☐ ☐

  on scientific matters ?

- Is there any humour in teaching the lesson of writing ?   ☐ ☐ ☐

- Do you  shout on your pupils when making   ☐ ☐ ☐

  written mistakes ?

- Do you let them correct themselves when making mistakes ?   ☐ ☐ ☐

- Do you praise your pupils when making progress   ☐ ☐ ☐

  in writing ?

## 6 - Any Other Comment

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