Università
Ca'Foscari
Venezia

Master's Degree programme – Second Cycle
(*D.M. 270/2004*)
in Scienze del Linguaggio

Final Thesis

Ca' Foscari
Dorsoduro 3246
30123 Venezia

The Mnemonic Abilities of University Students with Dyslexia.

A survey of the most used vocabulary learning strategies

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Academic Year
2014 / 2015

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Abstract

This thesis sets out to analyse the vocabulary learning strategies that university students with dyslexia use in foreign language acquisition to retain new lexical items.

Several researchers (Denckla & Rudel 1976a; Denckla & Rudel 1976b; Johnston, Rugg, Scott, 1987; Swanson, 1994; Hulme & Roodenrys, 1995; Alloway & Gathercole, 2012) focused their attention on working memory and learning disabilities in order to investigate the relationship between mnemonic skills, vocabulary learning and neurodevelopmental disorders. These surveys are of great importance because poor memory skills may result in limiting the progress of university students.

However, there is still much to be investigated with respect to memorization strategies used by dyslexic learners, especially since most of the surveys, regarding vocabulary learning strategies, were carried out on typically-developing students from all over the world that studied English (Shanaoui, 1995; Lawson & Hogben, 1996; Lip, 2009; Ghadessy, 1998), however little reference was made to the Italian context.

In order to achieve an overview with respect to the most used vocabulary learning strategies and the relationship between past experiences and academic results, a questionnaire of 59 questions was administered to a sample of Italian university students with dyslexia. It aimed at investigating three main topics:

1. Which are the most used vocabulary learning strategies by the dyslexic students?

2. Is there a relation between the students' past school experiences, the choice of the appropriate strategies and their academic results?
3. Which learning strategies can be linked to positive academic results?

A general overview of the results shows that on-line dictionaries are the most referenced learning tools, followed by songs in L2. Furthermore, oral repetition of the word and the transcription of the sounds of the new lexical item with the L1 alphabet are also widespread memorization strategies.

The results also show that positive past experiences, such as the early diagnosis of the learning disability and study experiences abroad are related to good academic results. However, it is not a case that those that have achieved early diagnosis and that that have studied abroad for some time consider their learning strategies really useful. Hence, various influences may affect the choice of the most appropriate vocabulary learning strategies and, as a consequence, the academic results.

Introduction

This thesis deals with the mnemonic abilities of dyslexic university students in foreign language acquisition. The choice of this topic stems from a tutoring activity that I carried out from February to December 2015 in Ca' Foscari, University of Venice, with a dyslexic university student of the foreign language faculty. This experience gave me the opportunity to become acquainted with dyslexia and memory disorders and to incite my curiosity towards learning disabled students.

In the first part of this work, a theoretical description of dyslexia and memory will introduce the main topic of this work: vocabulary learning strategies in the foreign language acquisition process at university.

The first chapter will explain the concept of dyslexia that has been examined since the second half of the XVIII century and is still complicated to describe uniformly to this day. After having introduced the different types of dyslexia and the models to diagnose it, a description of the neurobiological aspects of dyslexia will clarify the functioning of the dyslexic brain. Then, an overview of the provisions that promote the continuation of the dyslexic students' studies will show from which tools dyslexics can benefit to address dyslexia at university.

Nowadays, thanks to the new language policy there is a higher number of mature age students and for this reason, chapter II will focus on the characteristics of the adult learners and the most known teaching methods in adulthood, from the most traditional to the most innovatory, such as the multisensory approach.

Multisensory activities aim at involving the mnemonic skills of the students that will be analysed in the third chapter. First, the general structure of the mnemonic system and the functioning of the impaired brain will be observed to understand the origin of memory disorders and then the attention will be focused on semantic memory.

In chapter IV the models of the semantic memory will be introduced after having defined the concept of lexical item. The organization of the mental lexicon is important to go back to the origin of the lexical disorders and to focus on the ways to present new words in foreign language acquisition.

The last chapter of part one will deal with some learning strategies and the way the students can use them. The role of the teacher will be considered as well, because he or she plays a crucial role in getting the students acquainted with new word-memorization strategies.

In the second part, there will be the analysis and the discussion of the results of the research questions of this work. The outcomes of a questionnaire administered to a sample of 22 Italian dyslexic university students will demonstrate which are the most popular vocabulary learning strategies, how past school experiences may influence mature age student's academic results and which learning strategies are linked to positive academic results.

I

Dyslexia

In the last few decades a number of researchers, like for example Marshall & Newcombe (1973) and Beauvois & Dérousné (1979), have focused their attention on dyslexia, a learning disability that was first detected at the end of the XIX century (Kussmaul, 1877) and that still has to be investigated, especially in the educational field.

The difficulty in finding a common definition for this learning disorder displays the complexity of its characteristics: the recent findings in neurobiology (Desmond & Fiez, 1998; Turner & Rack, 2006) have tried to describe the functioning of the dyslexic brain but the mere description of it is not enough to face its consequences in adulthood in the university context.

Dyslexia can be faced with the cooperation of teachers, tutors and students and by adapting dyslexia-friendly timetables that consider both strengths and weaknesses of the student (Brunswick, 2012; Asefeso, 2012).

Nowadays, dyslexic students may benefit from several tools that make the foreign language process easier: a part from the usual tools, such as memos or notebooks, there is an active web support offered by the Italian Dyslexia Association (AID) and there are several new technological tools that mentor the dyslexic students in the foreign language learning process at university.

1.1 Many definitions for one disorder

In 1883 Kausman developed the word "Dyslexia" by combining the Greek morphemes "dys-", meaning *difficulties*, and "lexis", that represents *word*. Hence, the etymology of the word "dyslexia" refers to a "difficulty with words" (Smythe, Everatt, Salter, 2004).

Dyslexia is a constitutional condition that can be defined as a Specific Learning Difficulty (SLD) and it has been estimated that in Italy there are 1,900,000 people with dyslexia (www.aiditalia.org/it/associazione-italiana-dislessia). The percentage of dyslexic students varies from country to country, dependent on the orthographic transparency of the language.

Students with SLD may encounter difficulties in different learning activities, such as reading, writing, spelling or manipulating numbers. In spite of everything, they may have good oral abilities in other activities. Moreover, it is common for dyslexic children to suffer frustration and have emotional and behavioral disorders.

The definition of Specific Learning Difficulty is an all-embracing definition that doesn't clarify all the aspects of dyslexia. It has many facets primarily due to different professionals being involved in working with SLD children: on the one hand there are doctors, on the other hand there are psychologists, linguists and teachers. Obviously, every profession approaches dyslexia from a different perspective. Doctors describe SLD as a physical ailment, psychologists focus on the psychological aspects of the education, linguists concentrate on the language

skills and teachers deal with the effects of dyslexia on the language acquisition (Payne, Turner, 1999).

Generally speaking, dyslexic students show difficulties in four areas (Bartlett, Moody, Kindersley, 2010):

1. Phonological skills: recognizing, pronouncing and sequencing letters is a difficult task. Furthermore, they also have some problems splitting up words into syllables. As a result they do not read quickly;
2. Short-term memory: bad memory skills affect the ability to comprehend a test;
3. Visio-spatial abilities: series of numbers, letters or visual arrays are analyzed by visual skills. The inability to visual tracking causes problems with maps and tables of figures;
4. Sequencing skills: poor sequencing abilities are responsible for weak organizational skills.

There is also a relation between dyslexia and visual stress. All the above-mentioned problems may cause difficulties in the visual area, namely, dyslexic students may see blurred letters, letters that move and letters or words that appear as double. For this reason they may get headaches from reading, that turns out to be a tiring activity. Generally speaking, dyslexic readers prefer large and widely spaced print in order to avoid difficulties with tracking across the page. Also bright lights can upset dyslexic students who do not like too much glare on the page (www.bdadyslexia.org.uk/dyslexic/eyes-and-dyslexia). The intolerance for the glare is called Scotopic Sensitivity Syndrome (SSS) and it is related to

sensitivity to light that makes it very difficult to read a text (Irlen 1989, cit. in Nijakowska, 2010).

The degree of the effect of dyslexia may vary from one student to another: some students may just have mild spelling and reading problems and others may show severe difficulties in terms of organizational abilities. It is even possible to suffer complete illiteracy. Each case is different and unique (Oneil, n.d.) and depends on the three main factors that influence dyslexia: family background, educational experience and the use of compensatory strategies (Brunswick, 2012).

Another difficulty in defining dyslexia is related to the age of the SLD students. Even if dyslexia is similar in both young and adult learners, not all the students display the same symptoms. On the one hand the main problem of children concerns literacy, on the other hand adults may have more difficulties with the demands in society (Lawrence, 2009).

A complete description of dyslexia has to take into account not only the reading difficulties but also its behavioral characteristics. Namely, the problems related to dyslexia extend beyond literacy skills. What first emerges is that dyslexics experience difficulty in processing information, namely, dyslexic people feel overwhelmed by long reports and they easily get muddled. Moreover, dyslexics may experience difficulties in the following areas:

1. Time management: organizing the appointments may become an arduous task;
2. Numeracy: symbol recognition and calculations represent a problem;
3. Spoken language: problems with locating words may interfere with communication and contribute to social difficulties;

4. Memory: weak memory skills are responsible for difficulties in recalling instructions, people's names, telephone numbers or other kinds of information.

The difficulties in a great number of areas may have several negative consequences, such as lack of confidence, low self-esteem, anger, frustration, anxiety and social interaction difficulties. It may happen that dyslexic people perceive themselves as worthless or they may feel angry for all the failed tasks in their life. For example, in some cases they have low memory skills that make them easily forget things and for this reason they may feel out of control and unable to function. Problems with social interaction may lead to isolation from peers and poor development of social skills (MCLoughlin, Leather, 2013).

However, not everybody has a negative attitude towards dyslexia: on the one hand there is the group of the hemispherists, on the other hand there are the campaigners.

Hemispherists take their name from the relation between left and right hemisphere. They try to maximize success in all walks of life and accept their own condition, both strengths and weaknesses, in a positive way.

Campaigners see dyslexia from another point of view. They describe it in terms of social, cultural and educational barriers and focus on the dyslexics' right to education. They do not see dyslexia as a deficiency related to the person but as a problem for the structures and mores of the society. Hence, they are called campaigners because their idea of dyslexia is related to their civil rights (Brunswick, 2012).

1.2 Subtypes of dyslexia

It is clear that there is no single definition for dyslexia, namely, dyslexia may appear in different ways. For this reason, researchers have described dyslexia as a complex system of subgroups that can be roughly divided into acquired dyslexia (in case of stroke or a trauma), or developmental dyslexia (this is the most common type of dyslexia and it has hereditary origin). Acquired dyslexia can be either surface or deep, while developmental dyslexia is phonological (www.dyslexia-reading-well.com/types-of-dyslexia.html).

Marshall and Newcombe (1973) described for the first time surface dyslexia. A student has surface dyslexia when he or she cannot recognize words by sight. In this case the dyslexic reader uses a grapheme/phoneme conversation technique for every word because the lexical way is impaired. The student has some problems with the regularization of irregular words and the reading of homophones that have a different orthographic structure. This type of dyslexia is particularly widespread in non-transparent languages, such as English. From an anatomical point of view it stems from a lesion in the left temporal region (Balconi, 2008).

Deep dyslexia affects on the one hand the reading of words, on the other hand the reading of non-words. The reading of words is characterized by semantic, visual, and/or derivational mistakes. This means that the dyslexic reader may substitute the word with a semantic similar word (*house* instead of *home*), with a structural similar word (*gab* instead of *gap*) or with a word that stems from the same root (*useful* instead of *useless*). A person with deep dyslexia has more difficulties with abstract words, adjectives, verbs and functional words, whereas concrete nouns

are a little bit easier to decode. This impairment is caused by vascular problems in the left hemisphere (Denes, 2009).

Phonological dyslexia was fist described by Beauvois and Dérousné (1979): it is the inability to read non-words, unknown words, and functional words. Furthermore, the student is not able to split the words into syllables or phonemes. Words that belong to the habitual vocabulary of the reader are preserved. This happens because the reader is just able to read through the lexical way but he or she cannot turn the graphemes into phonemes. In this case there is an impairment in the parieto-occipital region.

Another type of dyslexia is called pure alexia and it was described by Dejerine (1892). This kind of dyslexia is pure because there is no comorbidity with language impairments: writing, speaking and comprehension skills are preserved. In this case reading is very slow and it depends on the quantity of letters that are in each word. This difficulty may stem from the inability to group single letters or from the inability to identify quickly the letters.

1.3 The historical background of dyslexia

In 1877 a German physician (Kussmaul, 1877) observed the working of the brain after a stroke and he found out that in some cases patients may have text-blindness, that is the inability to recognize written words.

Some years later the ophthalmologist and assistant surgeon James Hinshelwood (1895) described in one of his articles the case of a teacher that suddenly become

unable to read books. Today this condition would be called acquired dyslexia (Ott, 1997).

Ten years after Kussmaul's observation, the German ophthalmologist Rudolf Berlin (1887) used for the first time the word dyslexia.

The first case of "developmental dyslexia" was described by Pringle Morgan (1896). He analyzed the productions of a fourteen-year-old boy, called Percy. Percy had some difficulties in spelling, even if he did not show other kinds of problems in other tasks.

Between '800 and '900 James Kerr (1897) and Samuel Torrey Orton (1925) continued the studies on dyslexia. Just in 1946 Anna Gillingham and Bessie Stillman (1956) started to work on the first educational program for dyslexic children and they called it *Remedial Training for Children with Specific Language Disability in Reading, Spelling and Penmanship*. They based their program on the multi-sensory teaching technique that consists in using simultaneously eyes, ears, hands and lips to learn.

At last, in the 1960s dyslexia was acknowledged for the first time as a specific learning difficulty and researchers understood that dyslexic people have an average or better than average intelligence but have some trouble in:

1. Input: the information that comes in from the senses;
2. Integration: the interpretation of the information;
3. Memory: the storage and the retrieval of the information;
4. Output: the ability of reading, writing and language in general.

In a first moment researchers believed that letter reversals were caused by output problems. Now it is attributed to cognitive and linguistic processes.

In the history of dyslexia three main scientific approaches have tried to explain the origin of dyslexia:

1. The phonological processing problem;
2. The visual processing deficit;
3. The cerebellar ailment.

Nowadays, considerable evidence supports the idea that problems in phonological processing cause a low development of reading skills. This deficit may persist also into the adult years, when the phonological processing deficit may co-occur with motor or visual deficits.

The expression *phonological skills* refers to three abilities: phonological awareness, phonological memory and rapid automatic naming. This means that having good phonological skills involves being able to identify the sounds of a language, manipulate them, remember them and retrieve sounds and words form long-term memory (McLoughlin, Leather, 2013).

1.4 Phonemic awareness and dyslexia

Phonemic awareness is an important ability to be able to learn to read in the early stages of development, without experiencing difficulties. To have phonemic awareness means to be sensitive to the smallest units of sound that carry meaning: the phonemes. It involves not only auditory discrimination but also, and most of all, metacognitive strategy. It's not easy for the English speakers to reach a good phonemic knowledge because it is a non-transparent language that lacks a one-to-

one match between phonemes and graphemes. In order to achieve this skill the speaker has to be able to:

1. Be sensitive to rhyme;
2. Match spoken words by initial sound;
3. Blend phonemes into spoken words;
4. Segment words into phonemes;
5. Manipulate phonemes in words.

This awareness can be taught and young children can easily acquire it. Dyslexic students encounter great difficulties with the phonemic awareness but if they receive direct instruction in this field, they can achieve good results. Dyslexia involves phonological processing difficulty but early intervention can change the way the brain functions: generally speaking, children with poor phonemic processing abilities compensate by using a part of the brain that is not efficient for reading (this part is not used by non-dyslexic children). Intervention should begin right from the outset, without waiting years and years for special services. Obviously, an early diagnosis is necessary in order to give immediately direct instruction in phonemic awareness (Birsh, 2011).

Weak phonological awareness is not the only issue responsible for poor phonological skills: dyslexic students generally experience difficulties also with phonological memory, the ability to memorize new words, and rapid automatic naming, the ability to retrieve words that have been stored in the long-term memory store (McLoughlin, Leather, 2013).

1.4.1 Three models for diagnosing dyslexia

The sooner dyslexia is detected, the easier the intervention will be. There are three models for diagnosing dyslexia.

The discrepancy model describes dyslexia as a contrast between high IQ levels and poor reading skills, despite adequate instruction. This model works by excluding a number of factors that may cause academic difficulty, such as low IQ score or sensory impairment. It doesn't really give the children the help they need from the outset because it waits the failure of the student to obviate the diagnosis. This means that the dyslexic student may wait more than 2 years before profiting from the required intervention.

The phonological core deficit model interprets dyslexia as a phonemic processing difficulty that has to be rectified with early instruction. Direct instruction may help them to improve the reading of phonetically regular non-words that happen to be particularly difficult for dyslexic students.

Response to Intervention (RTI) is another model for diagnosing a reading disability. RTI increases the intensity of instruction, from tier 1 to tier 2, for those children who do not respond to classroom instruction. If the students still do not respond to intervention they will acquire special services in tier 3. This model provides phonemic awareness instruction right from the outset so that all the students that need extra instruction can benefit from special direction as soon as possible.

Early diagnosis is not sufficient: periodic retesting is needed in order to revise the teaching plan periodically and the teacher has to focus on early indicators of

difficulty in a natural classroom setting. For example, if the preschooler is not able to rhyme words, the teacher should teach him or her explicitly how to do it (Birsh, 2011).

1.5 Neurobiological aspects of dyslexia

Dyslexia relates to anomalies within the central nervous system and may develop in several ways in every student.

From an anatomical point of view, all dyslexic people have something in common: they show similar brain anatomy, brain activity and function. Recent research has shown not only that developmental dyslexia is related to the biology of the brain but also that it has a genetic origin. Hence, it runs in families (Turner, Rack, 2006). The genetic theory was explained with the twin studies and it showed that dyslexia is genetically conditioned: the child of a dyslexic parent may be dyslexic too (Nijakowska, 2010). Twin studies are particularly important because twins share the same gene information and environment. Identical twins come from the same sperm and egg and therefore they are called monozygotic. On the contrary dizygotic twins share just a part of the gene information. Obviously, the probability to share the same learning disability is higher for monozygotic twins, namely, some recent research found out that 60% of reading deficit has a genetic origin.

In the current studies, researchers use functional neuroimaging to measure brain function and to understand the responses to the cognitive tasks of the brain. Functional Brain Imaging has a great advantage because it allows us to see how

the brain works during the performance of a task, without damaging the person's health. The study of brain activation allows to measure and map changes and patterns of the brain. Furthermore, it shows which areas are responsible for phonological processing and reading. Namely, dyslexic students have a different activation pattern of neural circuits. There is a difference between dyslexic and non-dyslexic students because dyslexics do not connect vital structures of the neural network: dyslexics under-activate or have a lower quantity of connections (Turner, Rack, 2006). It is a small region of chromosome 6 that is responsible for dyslexia. This gene lies in the middle of a group of genes that work for the immune system (Nosek, 1997). Hence, skilled reading is hard to acquire because the neurons responsible for the phonologic messages, indispensable to speech, do not connect in the right way (Shaywitz, 2008).

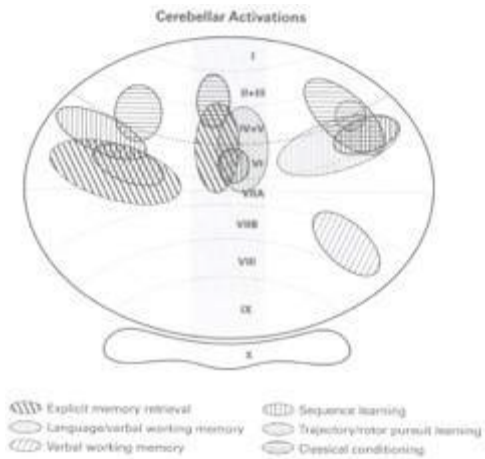
Moreover, some studies demonstrate that dyslexia depends on a reduced cortical asymmetry and on abnormalities in the size of the corpus callosum (Nijakowska, 2010). Whereas non-dyslexic people are characterized by an asymmetrical brain structure (the left hemisphere being larger than the right one), dyslexic people show a symmetric structure, most of all in the planum temporale. Another distinctiveness of the dyslexic brain is the migration of some clusters of neurons to the cortex during the prenatal life: in the non-dyslexic brain there is no such neuronal migration (MCLoughlin, Leather, 2013).

An important part of the brain that human beings use to read is the cerebellum: it is responsible for coordination and movement. In the case of premature birth, an injury in this area could cause motor, language and/or cognitive deficits. The cerebellum integrates sensory information, predicts the expected consequences of

actions (from a muscular point of view) and it tunes and automatizes actions. This part of the brain doesn't work alone: it cooperates with the sensory regions and it receives information from proprioception (Reid, Fawcett, 2008). Moretti and colleagues (2002, cit. in Nicolson, Fawcett, 2010) report that damages to the cerebellar vermis provoke reading errors because this area is responsible for the interconnections between the cerebellum and the linguistic areas. Moreover, an injury to this area is responsible also for attention and working memory deficits, difficulties in detecting moving patterns, and problems in phonological discrimination (Malm, 1998, cit. in Nicolson, Fawcett, 2010).

Desmond and Fiez (1998, in Nicolson, Fawcett, 2010) describe the involvement of the cerebellum in verbal working memory and in explicit memory retrieval. Furthermore, this part of the brain is involved even in sequence learning, trajectory learning and classical conditioning. Figure 1 shows which areas the cerebellum activates:

Fig. 1 – The cerebellar activations (Desmond, Fiez, 1998)



Apart from the cerebellum, dyslexia is most of all related to the functioning of the left hemisphere of the brain, where there are the areas responsible for the language

skills. People activate the cortical regions to talk, such as the occipitotemporal, temporoparietal and inferior frontal network (Nijakowska, 2010). In the case of dyslexia there is an initial slow activation of the right hemisphere, and just later of the left hemisphere, whereas the reverse happens to non-dyslexic people (MCLoughlin, Leather, 2013).

A further anatomical difference in the dyslexic brain is related to the quantity of gray matter: dyslexics show a reduction in gray matter volume in different areas, such as the left parietal cortex (in children), the right supramarginal gyrus and the fusiform gyrus (in adolescents). Some research detected a lower quantity of gray matter also on both sides of the anterior cerebellum (Birsh, 2011).

1.6 Provisions about students with Special Educational Needs

Nowadays, in Italy, there are several laws that concern the education of students with Special Educational Needs (SEN). The Italian school system began an integration policy in 1977 with the law 517.

Integration means to be in harmony with the other students, to create a coordinated whole between the different personalities of the classroom and to combine the diversity of the group into an integral whole.

Every student may have Special Educational Needs in his or her educational curriculum. Some may show problems for a longer period, other for a shorter time. The reasons can be different: SEN may be related to health, biological, physiological or psychological reasons. Schools and universities have to focus on the differences in order to give the right service to the full spectrum of students:

two important services are the social service and the educational psychology service.

The expression Special Educational Needs refers to three different sub-groups of students:

1. disability;
2. specific evolutive disorders;
3. socio-economic, language or cultural disadvantage.

Dyslexics belong to the second group: specific evolutive disorders include specific learning disorders, specific language disorders, nonverbal learning disorders, motor coordination disorders and attention deficit hyperactivity disorder.

Students with these kinds of disorders may benefit from the law 104/92. First of all, it promotes the integration of the disabled person into the family, school, work and society as it aims at avoiding social isolation.

This law places a high value to the scientific research as a means to promote prevention, early diagnosis and immediate intervention.

It is important not only to focus on little children and on their development but also on adults and their success in the field of work. The right to education must be acknowledged from the early school years to the last year of university.

As soon as the child begins school, he or she can benefit from a back-up teacher. This will not be enough: schools and universities must be equipped with the appropriate technological tools and teaching aids. Furthermore, they can benefit from a personalized syllabus, a PEI (*Piano Educativo Individualizzato*). In order

to test the students, the teachers have to take into account their abilities/disabilities and give them more time to complete the exercises.

University students may use on the one hand teaching aids and technological means and, on the other hand, qualified tutors that will help them to study. These aids achieve to acknowledge the integration of the SEN students in the university system.

As an added benefit, the final aim is to favor SEN students to find a job and lead a successful life at work. In order to pass a competitive state examination disabled people can benefit from special aids and extra time.

SLDs were first acknowledged as specific disabilities with the law 170/2010. Its nine sections deal with the educational aims of the Italian schools, the diagnosis of SLD, the teacher training and the compensatory and dispensatory measures.

First of all it wants to acknowledge the right to education for all the students. The teachers should help the students to be successful by avoiding making them feel uneasy. Therefore, SEN students can benefit from a personalized syllabus in order to reach their educational aims. For example, dyslexic students may use compensatory and dispensatory measures to face their difficulties. Hence, school tests should take into account the specific needs of the students. Parents are considered of great importance because they have to cooperate with the school and help their children actively. Obviously, the most important aim is to ensure that every student has the same opportunity to work in the future. It is therefore essential to achieve a diagnosis as soon as possible.

In summary, SLD students need particular teaching methodologies and it is not only important to use appropriate teaching measures but also to have well trained teachers.

Other guidelines come from the law 53/2003 that focuses on the development of the human beings regardless of their differing dispositions. Every student has the right to choose the best type of school, by taking into account his or her needs and skills: the personal abilities of every student must be developed and encouraged.

1.7 Dyslexia in adulthood

All the previously mentioned rules deal with dyslexia and its effects on education, from primary school to university. Hence, it is clear that dyslexia is a disorder that must be faced with the appropriate tools from childhood to adulthood because it is a lifelong difficulty (Nosek, 1997).

Nowadays, the number of adult dyslexic students has increased thanks to the government efforts to favor access and participation. The *Special Educational Needs and Disability* Act (www.legislation.gov.uk/ukpga/2001/10/contents), acknowledges the right for education of disabled people and makes it unlawful to discriminate against disabled students. The government's main aim is not only to favor access but also to ensure progression within and beyond university. Namely, there are a great number of dyslexic students who fail before completing a degree course and for this reason it is necessary to provide them a strong support. Obviously, the difficulties that dyslexic people encounter during their life influence their future employment: dyslexics are more prone to jobs with

limited literacy demands. Some recent research has shown that they are more likely to choose a job like health worker or salesperson (Brunswick, 2012).

Adult dyslexics are a heterogeneous group. Namely, there are different types of grown up dyslexics and they may be divided into three categories:

1. The Candid Dyslexic: he or she knows and accepts his or her condition and is honest about these difficulties;
2. The Closet Dyslexic: he or she knows his or her problem and is ashamed of this condition;
3. The Confused Dyslexic: they don't know that they are dyslexic and have struggled their whole life at school.

The main characteristics of dyslexia in adulthood were described in the *National Adult Learning and Literacy Center*. A dyslexic adult is of average or above intelligence, has long-standing difficulties in reading and expressive language and shows poor performance in oral and silent reading. His or her reading patterns are characterized by skipped words, substitutions, deletions, transposed letters, difficulty in breaking words into syllables and jerky reading style. Furthermore, dyslexics show a tendency to reread lines, read words backwards and guess the meaning of the words. Some people lose place on page and experience eye fatigue.

Expressive language is made from syntactical and grammatical problems, letters and numbers written backwards, reversed letters, capital and lowercase letters mixed inappropriately, poor handwriting, punctuation errors and poor organization of the written text. Some readers whisper to self while writing (Nosek, 1997).

Because of all the over-mentioned difficulties, a dyslexic person will find academic activities and work tasks more taxing. A large quantity of written material tires the dyslexic student out and reduces his or her efficiency. Everyday writing tasks, such as memos, notes or short reports may be difficult for him or her as well. Obviously, also poor memory skills may influence the working life of a dyslexic. Human beings need the help of working memory in order to remember what to do. Moreover, poor hand-eyes co-ordination may cause some problems to the handwriting that seems untidy and messy. At university or in the work place, dyslexics may feel uncomfortable because of their over-elaborated and disorganized speech. Last but not least, the dyslexic person has to deal with some emotional reactions that may turn into an outburst if non-dyslexic people do not understand and respect his or her difficulties (Bartlett, Moody, Kindersley, 2010).

1.7.1 Some tools to adress dyslexia in adulthood

In order to cope with their difficulties, grown up dyslexics can use several technical aids or can just avoid reading or writing tasks.

Dyslexia continues to have an effect also on the work place. For some people dyslexia has a positive outcome and for others it has a negative result in the work place. As soon as childhood finishes, life seems easier for some dyslexics because they do not have to face learning difficulties anymore. These people turn out to be very successful for one simple reason: they suddenly find out they have a knack for something and sometimes they also realize that the gift is directly

derived from dyslexia. Hence, some people are able to get their loss of self-esteem back because they realize that they are successful in a specific activity. Unfortunately, not everybody achieves the same outcome, however there are some techniques that dyslexic workers and university students may use to face their difficulties. For example, they could:

1. Write their tasks down in a notebook or a piece of paper. This method is particularly useful if they are not able to recall a great deal of information from memory. Another useful tool could be also the electronic scheduler, a good means to remember appointments and deadlines;
2. Find a quiet environment to work in or study properly;
3. Orientate themselves by remembering landmarks rather than following directions. Some dyslexics may exhibit problems regarding directions. In this case, the best strategy would be the landmark method;
4. Highlight memos or written instructions. In this way it is possible to avoid the white glare that some dyslexics have difficulty with;
5. Mark the key words of the documents or texts. This avoids them having to reread the whole text. The disadvantage of this technique is that not all the documents can be marked. Namely, a book that belongs to a library can't be underlined (Oneil, n.d.);
6. Intersperse periods of computer work with other kinds of activities. It is not always possible to have a dyslexia-friendly employer, but depending on the nature of the job, the best strategy for a dyslexic worker would be to use anti-glare screen filter, if it's not possible to alternate activities;
7. Use spell-check or grammar-check services on a computer;

8. Write mind maps to organize the most important ideas;
9. Record lessons and meetings so that it is not necessary to take notes (Brunswick, 2012);
10. Search the new words on electronic dictionaries that are quicker than conventional dictionaries;
11. Use calculators to overcome difficulty with numbers;
12. Use voice-activated computers. They are costly but allow one to control the computer through voice, for example through a dictation to the word-processor (Asefeso, 2012).

Every worker or student has his/her own way of working: some techniques may be good for some people, others may not be so good for others.

Even if there is not much one can do against dyslexia in adulthood, it is possible to face it with the right strategies. The USE approach (Nosek, 1997) could be useful to remember the main goals. It focuses on three aspects:

1. **U**nderstanding: understanding dyslexia means to increase the value of the abilities and to minimize the disabilities. It is important to accept dyslexia in all its positive and negative aspects and to consider failure as a teacher;
2. **S**upport: a great way to face this difficulty is to meet other dyslexics, for example in support groups;
3. **E**ducation: it is a good idea to learn as much as possible about dyslexia by contacting national organizations or asking for free literature. In Italy there is the *Associazione Italiana Dislessia (*www.aiditalia.org) that helps dyslexic people.

A negative view of life may interfere with study and work. That's why dyslexics have to take into account some tips to get past the problematic stages of life.

First of all, the adult dyslexics have to remember that everyone has off days. Inconsistency doesn't have to destroy the dyslexics' self-confidence.

In order to simplify the reading process they may use large print text, audio-taped books and video-taped materials. It could also be beneficial to ask for someone else's notes to study.

Expressive written language can be helped by using a word-processing software package. With this tool the student can make changes by moving or deleting words or sentences within the document.

It's not a good choice to avoid problems: the student should ask for help if he/she needs it, without running away from dyslexia.

Even if it is difficult to develop appropriate social customs, the dyslexic adult should try to tune in on the conversation and make it work. Small talk could seem difficult to face but it is important to avoid tuning oneself out of conversation just because it seems difficult.

For dyslexic adults it may be hard to organize directions and keep things in order. In this case they should keep a notebook or a calendar and schedule all the appointments. This will help them sequencing the appointments.

In order to learn quickly the adult learner can use a combination of visual, auditory and kinesthetic approach. Namely, there is no ideal learning style: the only solution is to use what works best for the student.

Another problem of dyslexic people is related to memory. Short-term visual and auditory memory are often damaged. This deficit places the adult dyslexic at a

disadvantage, especially if he or she has to learn new material. The student may use an association method in order to remember new things by tying them together.

Dyslexics' bad performances may be related to anxiety and loss of self-control. Performance anxiety can be solved by rehearsing situations as often as possible in order to relieve stressful moments. The best solution is to remove oneself physically from the stressful situation that causes the anger (Nosek, 1997).

1.8 The role of the teacher with mature age dyslexic students

Is not rare that the dyslexic student feels like an outsider of the group, namely, his or her disorder may lead him or her to an alienated and marginalized condition.

The teacher plays an important role to minimize the disorder: the appropriate teaching strategies can help the student to feel at the heart of the activities without feeling his or her own condition as different.

First of all, the teacher has to understand the strengths and weaknesses of the student. A hospitable environment can improve the language acquisition and in general the abilities of the student. For example, the teacher should stand not too close to the student and not too far away from him or her so that the dyslexic can pay attention to the teacher without distractions. Staying too close implies that the student feels under constant surveillance and different from his peers, staying far away can cause the loss of the student's attention. Furthermore, the teaching methods should take into account the physical and emotional condition of the student.

Second, in the Italian university system, university students with dyslexia can benefit from a tutor. The cooperation between teacher and tutor aims at reinforcing the student's weaknesses. Most of all, the tutor explains how to use the best studying strategies in order to achieve better metacognitive skills. There are some tricks that teachers and tutors should take into account when they deal with dyslexic students: they should administer exercises one at a time, give a handout if there is not enough time to copy everything from the blackboard, use different colors to write a text on the board, and so on.

Third, the student needs a flexible timetable. This means that imposed deadlines have to take into account that dyslexics need extra time to perform adequately.

The teacher dealing with special education program has to establish not only the student's starting point but also his level of difficulty: it is important to check where the gaps in his or her knowledge are, in order to create the appropriate teaching program. For example, the teacher can use the Developing Literacy for Study and Work (DSLW): DSLW is a combination of five tests that the teacher can administer and interpret by him or herself. It is composed of a sentence reading test, a silent reading comprehension test, an isolated word reading test, a spelling test and a timed writing composition (Townend J, Turner , 2012).

1.9 Web support for dyslexic adults

Nowadays, dyslexic students can rely on the AID, Italian Dyslexic Association (*Associazione Italiana Dislessia*), that accommodates all Italian students that suffer from dyslexia. Apart from dyslexic students, the AID is composed of

parents of dyslexic children, doctors, psychologists, speech language pathologists and teachers.

This association wants to bring all the dyslexics together in order to give them the appropriate support and help them to face their difficulties (www.aiditalia.org/it/associazione-italiana-dislessia).

In the AID website dyslexic students can find all the information about dyslexia and learning disabilities. The main aims of the AID are:

1. To make teachers aware of the characteristics of dyslexia;
2. To promote research in the Learning Disabilities field;
3. To help dyslexics to face their difficulties.

For this reason the AID organizes seminars, training courses and it promotes further research by paying out study grants (www.aiditalia.org/it/associazione-italiana-dislessia/mission).

The AID considers teacher training important, namely, in every school or university there could be the necessity to train new qualified teachers (www.aiditalia.org/it/servizi-e-formazione/corsi-di-formazione). AID instructors are responsible for the teacher training and they instruct them in the use of compensatory means, they explain how to organize the teaching materials and they clarify the characteristics of dyslexic students (www.aiditalia.org/it/news-ed-eventi/news/bando-di-selezione-per-40-aspiranti-formatori-scuola).

Moreover, AID also organizes after-school activities to teach the students which learning strategies are the best to reach self-sufficiency while studying. The AID Campus, for example, is a one-week stay that aims at teaching the dyslexic

students how to use the compensatory measures in an amusing and informal experience.

Furthermore, in the AID website it is possible to find the information needed for an early screening. The A.p.ri.co program, *Prevention, reeducation and compensatory intervention program with the aid of technological means for children with learning disabilities,* wants to detect as soon as possible, the dyslexic students in the primary school in order to start an early intervention program (www.aiditalia.org/it/servizi-e-formazione/servizi-per-gli-studenti).

On the AID website the dyslexic students can find an on-line support system, called *help-line*, and they can telephone if they want to ask for information or if they need psychological support.

The website also explains how to find legal advice, if they believe that law 170/2010 is not being obeyed. The first legal aid is free of charge and if there are more serious problems, the dyslexic student can benefit from a reduced rate to continue the contentious procedure.

If the dyslexic student, with a certificate recognized by the law 104/92, has to spend a lot of money for an intervention program, he can ask for a monthly allowance. The dyslexic will receive the money if the INPS doctors assess that the dyslexic student really needs it. Obviously, they can benefit from an allowance to buy materials that they need to face their difficulty.

Other areas of interest of the AID are the role of the parents and exam support. The parents of dyslexic children can ask for a flexi-time in the workplace because the law 170/2010 acknowledges the importance of the parents' support regarding education.

Furthermore, the AID website clarifies that since 2006, it is no longer possible to undergo an oral exam to take the driving license test. If they want, they can ask for a different modality: a listening test (www.aiditalia.org/it/servizi-e-formazione/servizi).

Last but not least, the website gives all the information the students need to continue their studies with the appropriate support. Thanks to law 170/2010, they can profit from compensatory and dispensatory measures starting from the entrance examination to the university. Moreover, dyslexic university students have the right to benefit from technological tools and skilled tutors (www.aiditalia.org/it/dislessia-a-scuola/universita). An example of a technological tool is the AID digital library: it is an on-line library where the dyslexic students can find PDF books with a speech synthesizer (www.libroaid.it/chi-siamo/).

Summary

Since its first use, the word dyslexia has been difficult to define. Dyslexia requires more definitions because it has different characteristics in every student and because more than one profession deals with this learning disability.

Research in this field started two centuries ago, but just since a few decades ago the world of education has acknowledged the necessity to provide assistance for students with dyslexic difficulties.

Thanks to new scientific tools it is now possible to observe the inner structure and working of the human brain: functional imaging allows a clear vision of the dyslexic and non-dyslexic brain activity.

The discovery of the neurobiological origin of developmental dyslexia empowered the dyslexia lawmaking process. Nowadays, dyslexic students have the right to education. Several laws support dyslexic students and the educational system takes care of them from primary school to their university years.

The dyslexia support system is bolstered not only by the government's laws, but also by skilled teachers. Teachers that deal with dyslexia need to know the appropriate teaching strategies for their dyslexic students. Also university teachers play an important role in organizing dyslexia friendly lectures. More and more, dyslexic students decide to start a university experience and the governments' laws attempt to support their academic success.

In order to achieve successful results, university students can benefit from the help-line service of the Italian dyslexic association (AID) that was created to make dyslexic people aware of their rights in the educational field and in their everyday life activities.

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II

Foreign language acquisition in adulthood

2.1 The heritage of languages in Europe

The education of the dyslexic student doesn't end after the secondary-school degree. The world of work asks for skilled workers and for this reason it is necessary that everybody follows a course to learn how to work properly. Some people may choose an academic course, others may choose a training school but almost everybody will have to study a foreign language to improve the quality of his or her future life.

There are about a billion people in the world that learn English as a foreign language and the number of foreign language students increases taking into account also learners of other languages such as French, German, Spanish and so on. People may decide to learn a foreign language for many reasons: to integrate themselves in another culture, to strengthen their own cultural identity or to facilitate international communication. It is clear that the actual world is multilingual: there are few chances to survive with just one language in the academic world first and in the work place later on. For this reason everybody has the right to take up a language course in order to become a real citizen of the multilingual world, regardless of their culture and condition: this means that dyslexic people too, must be part of this world (Johnson, 2013).

The heritage of languages and cultures in Europe are protected and valued by the *Common European Framework of Reference* (CEFR, www.coe.int/t/dg4/linguistic/source/framework_en.pdf) that aims at promoting the knowledge of the European modern languages. European mobility, mutual understanding and co-operation are the three principles that the European Union pursues. This means that all the sections of the European populations have the right to learn the languages of other countries: the foreign language students base their learning on their needs and characteristics and the teachers develop appropriate methods and materials for them. The development of the student's motivation is of central importance during their whole lifelong learning program, from pre-school to adulthood.

The current educational system wants to favour the cultural dynamism in order to create an active world of work: regardless of the culture and the identity of the person, everyone has the right to study in order to improve his or her job opportunities. In the last few years the European Union has promoted this way of thinking with the following programs: the *Memorandum on Lifelong Learning (www.arhiv.acs.si/dokumenti/Memorandum_on_Lifelong_Learning.pdf)*, the *Barcelona European Council* (www.ec.europa.eu/invest-in-research/pdf/download_en/barcelona_european_council.pdf), and the *Standards and Guidelines for Quality Assurance in the European Higher Education Area (*www.enqa.eu/wp-content/uploads/2013/06/ESG_3edition-2.pdf).

They aim at developing the appropriate educational strategies in order to widen the lifelong learning perspective amongst everybody. The lifelong learning viewpoint involves an endless learning of new skills so that the student can reach

better abilities to use in the work place. To be more precise, it would be better to talk about *lifewide learning* because education absorbs all the aspects of life from childhood to adulthood: an internet web site, a song, a movie or a game may become interesting learning opportunities if the student makes good use of them (Begotti, 2006).

The European Union is changing its society and its economy and a superficial knowledge of these two elements is no more sufficient. In order to have an active role in society it is necessary to be always updated and to participate to the economical and the social life of this system. Starting from the primary school everybody deserves a quality instruction that has to go on until adulthood. The main aim of the program is to teach how to learn, so that the student can use the appropriate strategies while studying. The *Memorandum* wants to strengthen and improve the educational syllabus and to enhance the number of students who want to follow a course. For this reason the educational system has to create teaching programs that must be suitable to the needs of all the students (www.archivio.pubblica.istruzione.it/dg_postsecondaria/memorandum.pdf).

2.2 The characteristics of the adult learner

The European life-wide learning program shows that education doesn't end with high school but, on the contrary, it goes on until adulthood. When speaking about adult learners it is difficult to find the right definition for this category of students. The first problem emerges because it is hard to say when adulthood begins and when it is over. This period of life changes with every different perspective.

Duccio Demetrio (1990) believes that there are many *adulthoods* depending on culture, place and time. For example, nowadays in Italy political adulthood begins at eighteen but the other nations may not follow the same pattern and in the past adulthood used to start at twenty-one. Moreover, being politically adult doesn't mean to be adult in every way, namely, Malcolm Knowles (1973) distinguishes between four factors to describe grown up people: biology, politics, society and psychology. Biological adulthood refers to the ability to procreate and political adulthood to the right to vote. A person becomes adult for the society when he or she takes up a social position and he or she becomes adult from a psychological point of view when he or she is self-sufficient. From an educational point of view the adult learner is able to decide alone his or her educational goals by considering the needs, the aims for the future, the strengths and the weaknesses.

Teaching to an adult learner is not the same as teaching to a child: on the one hand pedagogy is the science used to deal with children, on the other hand andragogy is the teaching theory for adults. The word *andragogy* comes from the Greek *anér*, that means man, and *agein*, that means to lead (Zamborlin, 2003). It was the German primary-school teacher Alexander Kapp (1833) that coined this word and one century later the sociologist Rosenstock (1925) used it again to describe the contrast between pedagogy and andragogy. The term andragogy became widespread just in the 60s thanks to Knowles (1984), who believed in a first moment that andragogy and pedagogy had nothing in common. In a second moment he realized that it was not possible to strictly divide these two education theories. Actually, children sometimes need research activities that are generally

used with adults and grown up students sometimes need a teacher that can mentor them, as if they were children (Begotti, 2010).

Even if there is no wall between these two theories it is possible to identify some specific characteristics of the adult learner. The adult learner feels responsible for his or her own choices and his or her aim is to find fulfilment in the academic program. The adult attends a university course because he or she believes that it is useful for the future life. Moreover, the adult's current academic life is influenced by all the past experiences: this means that his or her behaviour depends on the positive and negative aspects of the past school years. Childhood influences adulthood, namely the adult learner is aware of the difficulties that one has to face at university because he/she has already experienced different kinds of problems (Knowles, 1984).

For this reason, an appropriate teaching plan for adults has to take into account not only his present condition but also his or her developmental, educational and medical histories. The research in this field aims at determining what interferes with the dyslexic student's language abilities and which are the weaknesses and the strengths of the student (Birsh, 2011).

2.3 A brief history of the language teaching methods

The history of didactics is a helpful tool to avoid the mistakes of the past and to give the students the best instruction with the appropriate methods and materials. In the last four centuries the teaching methods have changed because of the

historical, cultural and social background. Here is a brief history of how the language teaching methods have changed in the course of the time.

In the XVIII century Latin is no more a lingua franca. Pupils learn this language at school as if it were a dead body to observe and memorize. This happens because Latin finishes to be a communicative language and teachers explain its grammar with the formalistic approach. The grammar translation method turns to be the most widespread strategy to teach every foreign language: language is just something to memorize by heart. Morphology and syntax are the main protagonists of the language learning process, while the student is a passive learner.

The grammar translation model spreads for two main reasons:

1. Teaching all the foreign languages with the same method of Latin gives to the other languages the same dignity of Latin;
2. The teacher's work is not too hard because he has to explain just the rules and then he has to test if the children have memorized them.

The XIX century is characterized by the direct approach. The Berlitz Schools of New York adopt its policy: the teacher must be mother tongue and use just authentic materials. The approach is called direct because the students need to think directly in the foreign language, trying to forget their first language. The grammatical rules are not the starting point of the learning process but just the final step of an inductive method. For this reason it is recommendable to communicate without thinking about the mistakes that one could make.

In 1950 begins the structuralism: Skinner is the founder of the behaviourist theories. The student is considered as a *tabula rasa*, this means that he or she is

an empty board on which the teacher can write his or her teaching. The formula that describes the behaviourist learning process is the stimulus-answer-reinforcement sequence that can be applied with pattern drills exercises. Pattern drills are structural exercises that favour memorization by repeating always the same structure. This approach has a little bit of a drawback: it doesn't take into account neither the cultural aspects of the foreign language, nor its communicative contexts.

The culture becomes important in the 60s with the communicative approach that acknowledges the importance of sociolinguistic, paralinguistic and extra-linguistic aspects of language. The language is no more made of rules but of communicative functions. In order to talk successfully it is important to train the communicative skills and the grammar rules are a tool to reach this ability and not the main aim of the learning process (www.venus.unive.it/aliasve/index.php?name=EZCMS&page_id=465).

Beginning from the late 1960s there is a turning point in the history of didactics: the humanistic approach places the student at the centre of the learning process. The teacher has to create an appropriate learning program by taking into account the cognitive characteristics, the personality and the type of intelligence of the student. In 1983 Howard Gardner put forward the theory of multiple intelligences. He claimed that each student is different and shows a different way of thinking: this happens because everyone has a different type of intelligence. The abilities can be grouped in eight subtypes: musical-rhythmic, visual-spatial, verbal-linguistic, logical-mathematical, bodily-kinesthetic, interpersonal, intrapersonal, and naturalistic. This subdivision doesn't want to restrict the

student to one modality of learning: each student has a mixture of more than one type of intelligence that makes him or her unique.

Moreover, Krashen and Terrel's (1983) naturalistic language acquisition theory proposes a stress-free classroom setting in order to avoid the affective filter effects. A nervous learner may have difficulties in the acquisition of language and this can lead to a separation between conscious learning of language and subconscious acquisition. Just a relaxed learning context can lead to fluent language use, this means subconscious and long-lasting acquisition. Krashen and Terrel also claim that the teacher has to graduate the language teaching at different levels: the student should be exposed to a comprehensible level a little bit higher than the level he or she can actually understand. A graded teaching is important because the learner acquires the grammar in a fixed order and the teacher has to respect the natural order of acquisition. At the end, all the language knowledge has a monitor function: it monitors the output but it does not generate new language.

2.3.1 The teaching method for dyslexics

Prior to the twentieth century, learning disabled people were described as unteachable. They were considered unable to learn until the beginning of the twentieth century, when some researchers found out that dyslexic people can learn, but at their own pace.

The history of the teaching methods shows that the teacher can choose between a great amount of teaching approaches. In the case of dyslexia it is difficult to say which method is the best one (Lawrence, 2009).

Dr. Harry Chasty, the ex-director of the Dyslexia Institute (now called Dyslexia Action), believed that the teacher has to teach the way the dyslexic student learns. This means that the teacher needs to suit the teaching program to the student's characteristics. Obviously, every student is different and for this reason every teacher will have to choose a different method. The best choice is the multi-sensory teaching method that blends visual, auditory, tactile and kinaesthetic modalities. This blending aims at creating a strong multi-sensory memory by giving the same information simultaneously in different ways.

There are some guidelines that the foreign language teacher should adopt to turn his or her teaching into a dyslexia-friendly education. The teacher should encourage the dyslexic student to sit near the front of the class because from this position he or she can hear clearly. Handouts and lecture notes should be provided from the teacher in order to avoid that the student makes his or her own notes during lectures. A good strategy is to organize the timetable in a clear way and to outline the structure of the lecture at the start considering that dyslexic students need more time to complete their work and that short breaks during class are essential. Moreover, dyslexic students must be allowed to tape-record the lectures and it is unwise to embarrass dyslexic students by making them read aloud in front of his or her fellows. There are also some visual clues that may help the dyslexic student. The teacher should avoid:

1. fluorescent colours in the texts;

2. black text on a white board;
3. background images that distract the student (this happens for example on Power Point slides);
4. slides, lecture notes or handouts that contain lots of text;
5. texts with font size inferior to 12 and single spacing between the lines;
6. fonts with additional ticks and strokes, such as **Times** or **Courier**. The most appreciated fonts are **Arial** and **Verdana**;
7. right-aligned, centred or justified texts.

The visual problems may be solved allowing them to work on coloured papers and presenting information visually, if possible. Important information can be presented in capital letters, so that the students can easily detect the key terms.

The main task of the teacher is to pay attention to misreadings or misunderstandings that can be caused by complex questions and that may influence negatively the student's assessment. Therefore, teachers should develop an assessment method that requires little writing. If there is an unknown assessor, he or she must be aware that the work was written by a dyslexic student (students can affix dyslexia cover stickers to inform the assessor about their condition).

Words of encouragement are one of the most successful tool that the teacher can use with a dyslexic student: they need a clear explanation of their mistakes, so that they can avoid the same mistakes in future and, most of all, they need encouragement to raise their self-esteem. The lecturer should encourage students to use new technological tools, such as learning support services that may help them while studying (Brunswick, 2011).

2.4 Foreign language learning and dyslexia

Problems with the native language learning are very likely to announce in advance difficulties with future foreign language acquisition. Ganschow and Sparks (1986, cit. in Nijakowska, 2010) described some case studies of some college students with learning disabilities. These students had already had bad experiences with their native language learning and the difficulties they experienced with the second language acquisition where strictly related to their former language learning processes.

Reading is one area that clearly shows the relation between native language and foreign language: individuals who struggle with reading in their language 1 are prone to fail in language 2 reading (Chodkiewicz, 1986, cit. in Nijakowska, 2010). Hence, earlier problems with the phonological or orthographic characteristics of the first language of acquisition may predict the re-emerging of difficulties with the new sound-symbol system of the second language.

Sparks (2006, cit. in Nijakowska, 2010) proposed convincing evidence to show that there is a distinct disability, called Foreign Language Learning Disability (FLLD) but further studies demonstrated that there is no such a disability. This means that the term FLLD is not only unjustified but also incorrect (Sparks et al., 2002, 2003, in Nijakowska, 2010).

LD and difficulties with the foreign language acquisition are not necessarily linked: in some cases there are LD students who get credits in their foreign language course, in other cases there are students with no LD that experience a great amount of difficulties in a foreign language course. Moreover, it is not rare

that very intelligent students struggle with FL courses even if they have no disability.

Hence, language learning skills can be described as a continuum in which foreign language learning difficulties may vary from mild to severe.

2.5 The multisensory approach

Multisensory teaching methods have been used since the beginning of the XX century, when the earliest teaching guides were written by Montessori (1912), Fernald (1943), Strauss & Lehtinen (1947) and Gillingham & Stillman (1960).

First of all, it is important to define the expression multisensory teaching. It is a teaching strategy that requires the activation of more than one sensory modality at the same time during the learning activities. It is characterized by an explicit language teaching that aims at facilitating the student's skills to recall information and to learn with a systematic, cumulative, direct and sequential method. Furthermore, this approach wants to enhance student's attention, to provide feedback, to avoid overloading, to give sufficient practice, and to provide reinforcement.

The student's results can be enhanced creating an active learning context where the adult learner is directly responsible for his or her actions. An active way of learning involves the use of mnemonic strategies created by the student him/herself: students who are provided with a mnemonic strategy learn not as readily as those who learn with their own strategies.

Structured language teaching methods have a great advantage, namely, they increase the activation of the left hemisphere (in particular the parietal-temporal and the occipital-temporal regions). This means that this specific strategy is useful to improve the word recognition skills of the student.

The main reason why the multisensory method seems to be the most appropriate is that our brain has a multisensory structure. Sensory inputs are processed by all the senses, even if it seems that an experience is specific to just one sense. This means that the everyday activities are modulated in more than one sense.

Furthermore, the multisensory structure of the brain favours attention, perception, and learning. Even if people are not aware of their multisensory skills, it is true that the brain regions respond to more sensory modalities from infancy.

It is important that the active involvement by student and teacher begins as early as possible, preferably at the earliest levels of instruction and it continues until the university years (Birsh, 2011).

Some electroencephalographic research and functional neuroimaging studies have demonstrated that people generally show a *Redundant Target Effect* not only in the academic context but also in everyday life. All the stimuli that arrive to the human body are stronger if they are bimodal and congruent, namely, the neural networks work quicker. On the contrary, unimodal stimuli and bimodal incongruent stimuli are not as successful as bimodal congruent stimuli. Hence, a student's answer will be quicker and more efficient with the *Redundant Target Effect* (Forster, Cavina-Pratesi, Aglioti, Berlutti, 2002).

2.5.1 A multisensory teaching for mature age students

Some recent statistics show that it is not so widespread to be a successful reader. A lot of students score below the basic reading level in overall reading activities. 25% of thirteen-year old students have poor reading skills and 43% of them score at the basic level. Generally speaking, at 8 years typical developing students should be able to decode with ease, if this does not happen, then word-study intervention must be provided. Hence, in the case of older students who do not have automatic word reading skills the teacher has to provide adequate instruction to improve their reading abilities.

Word-level instruction is never too late: it is a good strategy also for students who go beyond primary school. Obviously, every student has different needs and therefore literacy planning requires the placing in the appropriate intervention group. A teacher of an adult dyslexic has many challenges because the older the student is, the harder his or her instruction will be.

The intervention plan for older students requires an analysis of the areas of difficulty that may change from one student to another. Some dyslexics may show fluency problems, others may have good reading skills but poor comprehension abilities. In some cases students just have difficulties reading words accurately.

Teachers need a great amount of training to teach word structure appropriately. This means they need to know how phonology, orthography and morphology work. One of the most challenging tasks is to overcome the discomfort of the older student, so that he or she can achieve success.

Depending on the students difficulties, the lesson plan may include phoneme/grapheme instruction, word structure analysis, word reading accuracy, spelling improvement, and word/sentence dictation.

Older students could have difficulties in using sounds or phonemes. This problem can be solved by providing the students sound cards with the representation of the unknown sounds, namely, the use of key words may help the older students to memorize the phonemes. The tactile input is also a useful strategy to analyse word structure. Fingertips can be used to represent the sounds of the word because with every finger the student can visually imagine a grapheme and the sequential structure of the letters. Older students need also to manage multisyllabic words: first, the teacher shows the functioning of one type of syllable, second he or she teaches how to combine other kinds of syllables step by step.

Moreover, verbal explanations can be clarified by using a simple language to teach the rules, namely, a learning disabled student doesn't have any difficulty with the rules but with the complexity of the grammar language. Language can be simplified with sound cards and suffix cards: they allow the student to see directly the structure of the word. The understanding of the units of the word becomes particularly important from the fourth grade on. For this reason the teacher should focus his or her attention also to the smallest units of meaning of the words.

Older students often have to study alone, because the academic context requires individual work. Without a mentor they can face their reading difficulties anyway: they just need some technological tools, such as speech synthesis

softwares, and they can solve their writing disorder with other tools, such as word prediction, spellcheck, and graphic organizers (Birsh, 2011).

2.5.2 Multisensory lectures for dyslexic university students

At university, the foreign language lectures can be organized in a dyslexic-friendly way. This means that the teacher can adopt a lesson plan that facilitates learning.

Generally speaking, a well done lesson plan follows a set format: at the beginning of the lesson the teacher has to present the activities and the materials that he or she is going to use, the lesson should be divided in precise steps and it should be characterized by a rapid rotation of exercises. Moreover, a periodic measurement is necessary in order to check progress.

Short and focused activities are the best solution for dyslexic students and the activities have to become more difficult step by step. Before introducing new arguments or materials the mentor has to make sure that the students have reviewed what has been learned. Later, the students can practice in an environment controlled by the teacher/mentor.

Students who struggle with reading need a direct, explicit, sequenced, systematic, cumulative, and intensive foreign language teaching. This means that the teacher has to observe some fundamental rules. The teaching process has to be:

1. *Direct*: students know what and why they are going to learn;
2. *Explicit*: teachers do not make confusion;
3. *Sequential:* the lectures follow a logical order;

4. *Systematic*: lectures have a fixed plan related to the student's characteristics;
5. *Cumulative*: new information is added step by step, reinforced and eventually reviewed;
6. *Intensive*: the teaching process doesn't end as soon as the lesson finishes. Extensive practice keeps the student's daily life busy.

A well-organized multisensory lecture should start with a brief review of the sounds, letters and words already taught in the previous lessons. Phonemic awareness activities should not be undervalued: every language level needs phonemic activities. The appropriate attitude for an efficient language learning is a discovery learning that aims at linking the student's prior knowledge to new concepts. Also handwriting activities are useful because they help the student to reinforce the memory for letter sounds and words. In sum, a multisensory lecture wants to review all the components of the foreign language in order to give a comprehensive presentation.

The most important element of a lesson is a stress-free atmosphere: just a predictable environment in which the students know what will happen is comfortable. Learning in a protected context helps them to keep their time and space organized. The teacher plays an important role too, namely, the student-teacher connection is a powerful tool to create a successful learning environment. If the student feels that the teacher is approachable the teacher will easily gain his or her confidence. This relationship can be improved by using less teacher talk in order to focus the attention on the content of the discussion and not on the form (Birsh, 2011).

2.5.3 Multisensory activities to improve reading comprehension in adulthood

The multisensory approach can be used to develop listening and reading comprehension skills. It is not necessary to wait until the student becomes a fluent reader to develop comprehension abilities. It is better that comprehension strategies are taught as soon as possible, even if the student is not a fluent reader. In the first teaching stages, this ability can be improved focusing on an aural level, instead of a written level. Obviously, a child needs to be able to build and expand background knowledge and vocabulary in order to become a well-instructed future adult learner. For example, pre-school age children can improve their skills by listening to stories and by participating to oral discussions with peers and teachers. Another strategy could be to read picture books: in this way the student can hone his or her comprehension skills by focusing on the most important factors of the story that come into play in comprehending the text. Graphic organizers, such as story maps can be used to recall and retell the story. Hence, teachers have an important role: they model the thinking of the students by making them draw inferences, predictions and think about the sequences of the events and the characteristics of the characters. These visual strategies are useful to entice the student's attention but it is extremely important not to forget that in order to improve reading comprehension the teacher does not have to minimize the importance of text presentation. The multisensory approach does not aim at reducing the amount of textual language but to enrich the text in order to facilitate written comprehension through listening comprehension.

Reading comprehension may be a problem also when the student is already able to decode the text and to read it fluently. The teacher can help the student who struggles to gain meaning from the text by focusing the attention on the unite size of the text. Some students need to concentrate on words, whereas others need to focus on the sentence. There are some sentence comprehension activities that may help the student to better understand what happened in the sentence, who are the main characters, when, where and why the event happened. The teacher can use the question words (what, who, when, where and why) to ask the students some simple questions about the sentence phrases that they have read. A part from that, it is important that the students learn how to expand a sentence in order to create a complex or compound structure. The student's attention can ben focused on conjunctions by highlighting them with different colours or by rewording them with synonyms or similar expressions.

In other words, learning disabled people need from the beginning of their learning process a teacher that helps them to use strategies that typical developing students use spontaneously. In the university system students are supposed not only to be able to operationalize these strategies but also to generalize them to daily reading experiences. For this reason they have to know why they are using a specific strategy and most of all under what conditions they have to use it again. Hence, the most important rule to gain success is to learn how to apply the right strategies in the appropriate way. Teachers and students have to know six simple rules to apply correctly the comprehension strategies:

1. Every text may have a different purpose, depending on its nature. For this reason the reading activity will be different for every kind of text;

2. The teacher is supposed to explain with clear and simple examples which steps the student has to follow to use the acquired strategy correctly with the appropriate type of text;
3. For every strategy the teacher should show more than one example situation;
4. More practice means better results. It is better if the first activities are very easy and the teacher will provide more difficult tasks step by step;
5. The student should think out loud so that the teacher can see if there are misunderstandings or mistakes;
6. The teacher should listen to the students' proposals in order to see if they are able to use the new strategies on their own.

In the *Report of the National Reading Panel* (www.nichd.nih.gov/publications/pubs/nrp/documents/report.pdf) there is the list of the most efficient comprehension strategies that have a strong scientific basis. First, readers have to be aware of their understanding abilities in order to monitor their comprehension. Comprehension monitoring means to be aware of one's own understanding so that one can evaluate and self-regulate comprehension in order to implement strategies if comprehension fails. To understand where and why the comprehension has been blocked helps the student to face his or her difficulties. The first step to solve the comprehension problem is to identify the difficulty. Through think-aloud procedures the student can highlight the starting point of the reading difficulty and later restate what was read. A rereading activity may be useful in order to find the missed information and sometimes it

can be useful also to read ahead, which means to look forward in the text to search important information.

Second, cooperative learning is useful to learn reading strategies. In the last few years there has been an increase of classroom diversity. Mixed abilities classrooms involve the necessity to take into account a wide range of student's needs at the same time.

Generally speaking, a collaborative learning process characterizes primary school or secondary school activities. However, cooperative learning activities can be used also in the university lecture halls during foreign language learning activities. Students may cooperate to plan a presentation or to write a short dissertation in foreign language.

Working together means to discuss the text and to help each other understanding its meaning. Dealing with peers is also important to encourage each other in order to raise self-esteem. Furthermore, learning together is a good idea to learn collaborative skills while improving foreign language abilities and to learn comprehension strategies to enhance reading comprehension skills.

Third, the reading comprehension process can be bolstered by using graphic and semantic organizers (for example story maps). Creating a visual representation, such as a diagram or a picture, allows the students to have a clear organization of the relationships of the text in order to remember and retell the story in the future, namely, graphic organizers facilitate memory.

Moreover, questions can be an effective tool to clarify understanding and to receive immediate feedback. On the one hand the teacher can ask questions to

check the student's answer, on the other hand the student can ask him/herself questions to see if everything is clear enough.

In order to engage the student in a discussion group the teacher could ask questions about the author of the text as if the student were the protagonist of a query. Queries are a tool to support the reader while he or she is building the understanding of the text.

Skilled readers are used to asking themselves questions at the beginning, during and at the end of the reading process but this does not happen spontaneously to every student. Dyslexic students need a teacher that explains these strategies before, during and after reading in order to improve the comprehension of the text.

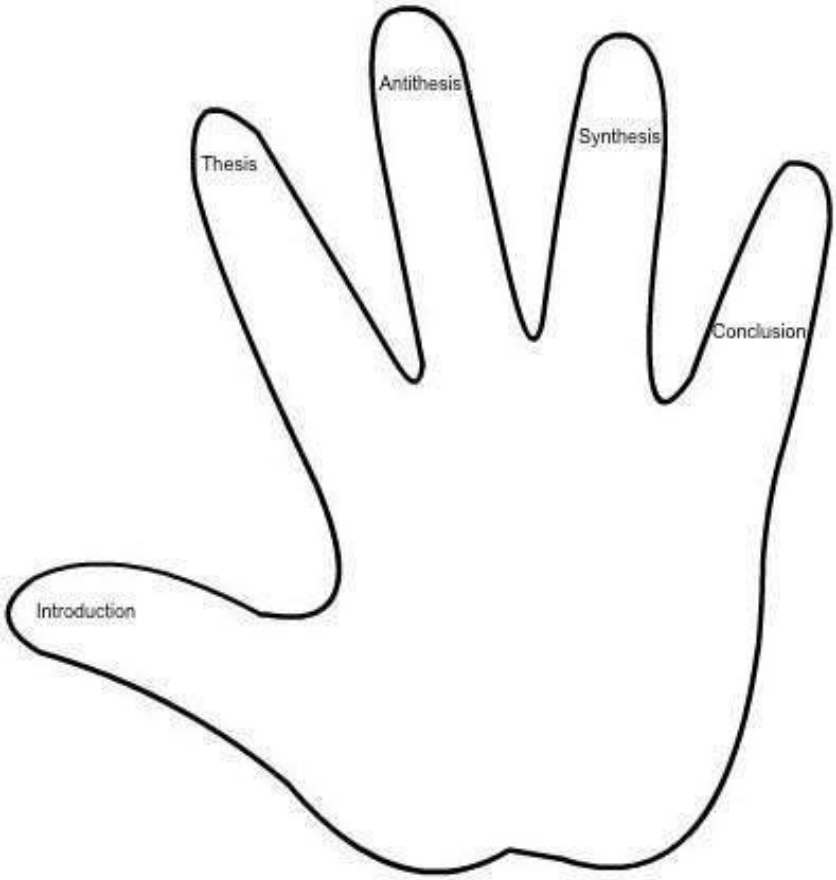
While reading, student and teacher should adopt a questioning behaviour by following six simple steps:

1. Read silently the text
2. After having closed the book, the student asks the teacher all the questions he or she needs to know;
3. The teacher asks the student the questions;
4. They have to repeat the same procedure with the new sections of the text;
5. As soon as enough text has been read the student has to try to make predictions about the rest of the text;
6. The final step envisages that they read the text to the end in order to verify the former predictions and to discuss them.

Eventually, it is important that the student works with the structure of the text and that he or she summarizes the most meaningful ideas of the text.

It is clear that if a student already knows how the general structure of a classic example of story is, it is easier to catch the main characteristics of the tell: characters, setting, problem, goal, action, and ending. A logical framework favours the creation of a mental pattern of what is going to happen in the story. In order to remember the most important elements of a story Stahl (2004) created the "*five finger retelling*" strategy: for every element of the story structure the student uses a finger that is simply a reminder. Stahl proposed this strategy for children but it is useful also for adults when they read an academic text or when they have to write an essay. They may use every finger as a prompt for an element of the academic text (or for other purposes): introduction, thesis, antithesis, synthesis and conclusion (see figure 1).

Fig. 1 - The five finger strategy for adult learners



Reading comprehension can be improved also with summarization. Summarization skills require three main abilities, namely, the student has to know what is important, generalize from the elements that are repeated more than once in the text and ignore unimportant details. For learning disabled students these tasks are particularly challenging. In order to face this difficulty they may adopt the RAP Paraphrasing strategy (Schumaker, Denton, Deshler, 1984) developed by the University of Kansas Center for Research on Learning. The RAP strategy can be carried out in three steps: the student has to read the paragraph, identify the main ideas of each paragraph and put them into simple words. Generally speaking, SEN students, regardless of their age, prefer to split up their work into small units so that they can avoid a cognitive overload. Furthermore, putting information into one's own words helps the students to understand and remember what they have read. During the reading process the teacher has to mentor the students so that they remember the three steps. After having described the three steps of this strategy, the mentor reminds the students to think about the meaning of the words of the text, then he or she should guide them to find the main ideas of the text and eventually the students have to summarize them with their own words. A well-done summary must:

1. contain a complete idea, expressed with subject, verb and complements;
2. be accurate;
3. not be characterized by useless repetitions;
4. make sense;
5. inform of useful details;
6. be written with the student's words;

7. contain one general statement per paragraph.

Some recent scientific research have shown that the reading performance improves not just by using one method but by combining more than one of the previous mentioned strategies. A multiple strategy instructional program is particularly effective to interact over texts.

In order to use appropriately these strategies, teachers need to attend an education course, where they can learn how to plan a lesson and how to organize instructional materials. For example the Miami-Dade County Public Schools, the University of Miami and the Florida Department of Education have designed a course in order to bring the right teaching practices to Florida schools.

There are also other strategies that may have positive results in reading comprehension activities. For example visualization improves student's mnemonic abilities as they read a text. The picture level is a good starting point for those students that have poor decoding skills that can move slowly towards words imaging. Hence, visualizing and verbalizing are two important steps that students may use to improve understanding.

The quantity of readings in the primary and secondary school influences considerably the future reading skills and the amount of known vocabulary of the adult student. It's in the first school years that he or she improves his or her vocabulary. A dyslexic student that avoids reading because he has poor comprehension skills will have a reading comprehension disorder in adulthood too. So, in order to become fluent, students need to practice more and more since the beginning of their school years. The most important prerequisite to enhance

the amount of readings is motivation: without motivation the student will never find a challenging learning context to practice.

It is the teacher that has to keep motivation alive: in order to do that, he or she can control the decoding process while the student is reading the text. Generally speaking, a text can be decoded fluently if the reader knows more than 95% of words and if the volume of mistakes is lower than 1 error per 20 words. The main aim of the teacher that wants to control the decoding process of the student is to reach 95% of correct decoded words: this happens by controlling the student's fluency and by demonstrating the word structure while reading. It is preferable to use a questioning technique instead of giving the students directly the solution to their answer in order to guide the students toward understanding (Birsh, 2011).

2.6 The role of the teacher in foreign language teaching

The foreign language teacher is more than a simple teacher: he or she is a facilitator that has to create the appropriate conditions so that the student can learn the new language. At the same time the teacher is a tutor, an organizer, a counsellor and a mentor. All these roles complement each other and work together.

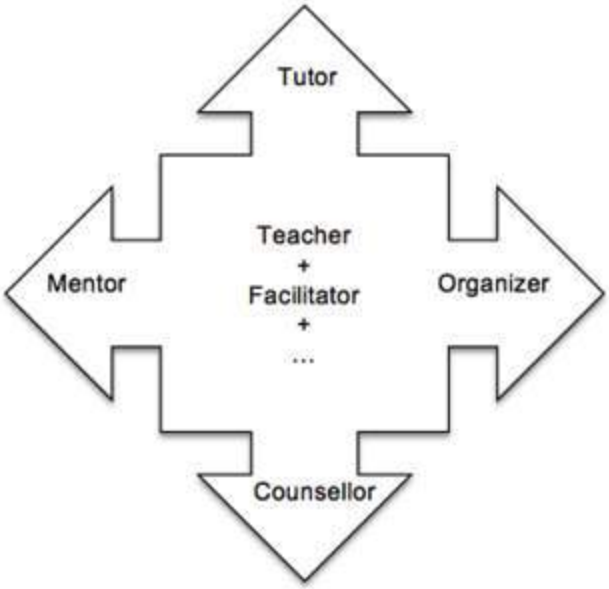
To be a tutor means to be a skilled language expert that supports the language acquisition process of the student.

The organizer has to manipulate the didactic materials by taking into account the student's needs, aims and acquisition modalities (Caon, 2005).

To be a counsellor means to act as intermediary and to build an affective bridge between the language and the student's needs.

Last but not least, the mentor has to open the doors towards the independence and responsibility of the student (Begotti, 2010).

Figure 2 – The multidimensional teacher



It is clear that the teacher is a multidimensional character and has to work on many different fronts:

1. Language: first of all, the teacher has to level out the talk so that the dyslexic students can easily understand the foreign language input. The teacher talk needs to be simple and full of information at the same time;
2. Code: redundant codes are useful to favour memorization. Pictures, music and texts can be used simultaneously to create a blended code;
3. Interactivity: problem solving activities and inductive language learning strategies enhance the student's participation;

4. Classroom: the student has to be part of a whole, namely, his or her group, and a cooperative learning method can help him or her to integrate the different personalities of the group;
5. Transfer: the foreign language learning can be sometimes difficult because of transfer problems caused by the mother language. This doesn't mean that the student has to abandon the mother tongue, on the contrary, he or she must learn how to benefit from his first language in order to improve the second language skills;
6. Organization: the teacher has to know when to use some materials and how;
7. Aim of the activities: to work with adult learners means to deal with students that have a specific aim, and have a lot of experiences behind them. For this reason it is important to organize the learning program by asking the students what they really want and explaining them step by step what the aim of each activity is, and why it is useful to do a specific activity (Caon, 2005).

In the last few years, the position of the modern teacher has changed: there is no teacher-centred model anymore, but a person-centred model. The new technological tools have changed the teaching strategies, namely, at the centre of the lessons there are the students that build their own learning process by using computer programs and internet web-sites independently. The learners are the protagonists of the lesson and the teacher is something like a tool that helps them to build their language acquisition.

To sum up, the main aim of the teacher is to teach how to learn actively, and not to teach in a passive way. An active teaching and learning process is made of three moments: the past, the present and the future. First of all, the teacher has to analyse all the abilities that the student learned in the past. Then, he or she can teach by using active teaching strategies and eventually, the teacher has to organize the program so that the student will be able to spend the new knowledge in the future life (Lombardi, 2013).

Summary

The citizens of the European Union are part of a dynamic society, in which good foreign language knowledge is essential.

Unlike the past, the educational process does not end after high school but it continues through adulthood. Adult learners belong to a new cultural background, where a life-wide learning system is needed. The presence of grown up students requires the employment of the theories of andragogy, because adult students need a different teaching method: they are no children anymore and have to be considered as peers by the teachers.

The history of teaching methods shows how the foreign languages teaching techniques have changed in the last few centuries. In a first moment the teacher was the leader of the teaching process, now there is a person-centered approach: The real protagonist of the lecture is the student and the teacher has to be facilitator, tutor, organizer, counselor, and mentor at the same time, giving great

importance to the decisions of the adult learner and to his or her needs and aims, especially in case of dyslexia.

Student-friendly lessons are an important weapon to motivate the students and favor the language acquisition. Most of all, it is important to take into account strengths and weaknesses of the students in order to create a relaxed atmosphere. Particularly dyslexic students need a dyslexic-friendly lesson based on a multisensory input so that they can learn by activating more than one brain structure. Multisensory activities respect the nature of the brain, namely, our cerebral system works following a multisensory elaboration. It is the teacher's duty to teach according to the natural brain functioning.

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III

The importance of memory at university

3.1 Memory and the first mnemonic surveys

Human beings are able to use past experiences to influence current behavior. This is possible because of memory that is the ability to encode, store and retain information. The human brain can recall past events thanks to this mechanism that is made of 4 steps:

1. Information recording through an encoding process;
2. Registration of the item;
3. Recall of the event;
4. Recognition of the information. In this last step takes place a comparison of the current experience with a past experience previously memorized. It is in this phase that a sense of familiarity allows to determine space and time of the new event (Cassano, Tundo, 2010).

The first distinguished researcher in this field was Herman Ebbinghaus (1885), who analyzed the mnemonic abilities of some people by applying specific techniques. Moreover, he studied also his own memory skills. The experiments carried out on himself aimed at studying the time necessary to learn: the more time the student spends learning, the more he learns. Specifically, he found out that the better learning solution is to learn step by step and not all at once. This means that the student's learning quality improves if he or she has two or more

days to study instead of one day. Ebbinghaus observed that people tend to memorize elements following a specific pattern: generally, they remember either the first or the last items of a list. The former is called primacy effect, the latter recency effect. Unfortunately, Ebbinghaus' research is not completely exhaustive because it doesn't take into account the complexity of the mnemonic mechanisms.

Frederick Bartlett (1932) continued to study human being's mnemonic skills by using the method of serial reproduction: a person reads a text, usually a popular story, and then he or she has to remember it. This technique let him understand that there is a pattern common to all the stories that facilitates the memorization process. The recalling happens because the reader has in his or her mind a specific pattern that favors the organization of information.

The first researchers who tried to give a complete description of the human memory system were Nancy Waugh and Donald Norman (1965), who distinguished between primary and secondary memory. The primary memory keeps information just for immediate use, on the contrary the secondary memory retains items permanently.

Richard Atkinson and Richard Shiffrin (1968) worked out the first important memory model: the modal model. They described the human memory like a multi store system where the information goes from one store to another in order to stay alive. There are three stores: sensory memory, short-term memory and long-term memory.

3.2 The stores of the mnemonic system

George Sperling (1960) carried out a research in order to understand how long a piece of information lasts in the sensory store. He worked on the visual modality and gave some people a matrix of letters and numbers to remember and he found out that the quantity of remembered letters and numbers depends on how much time passes. Generally, items stay in this store not more than half a second.

From the sensory memory the information may go to the short-term memory. George Miller (1956) got that this store has the capacity to remember from 5 to 9 items for 18 seconds. However, the human brain is able to remember also more than 9 items with the chunking technique.

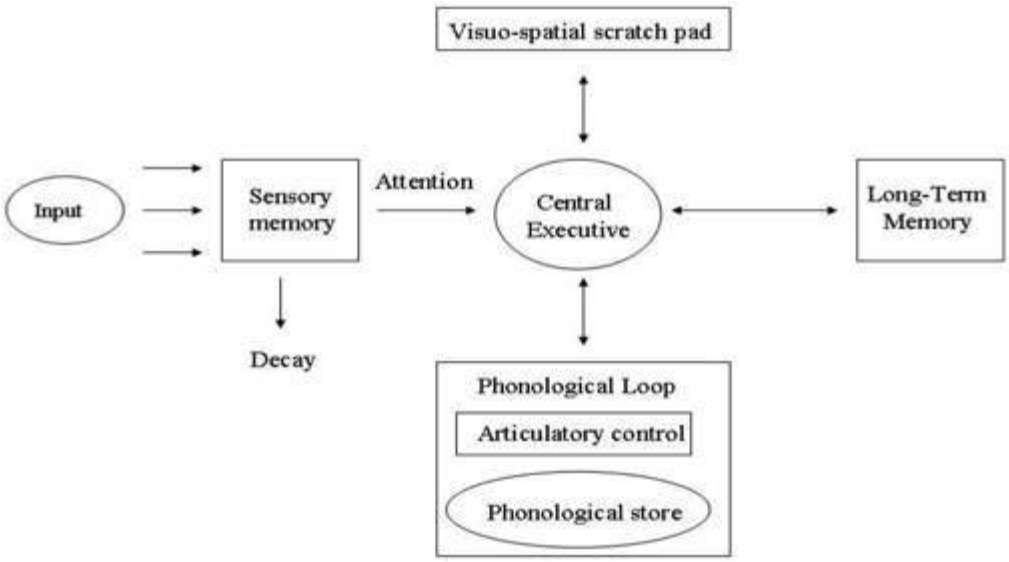
Alan Baddeley (1974) observed that it is easier to remember letters that create a word similar to a word that already exists in the mother language. This observation shows that the capacity of short-term memory depends on the one hand on the type of information that one has to remember and on the other hand on the possibility to repeat the information on a subvocal level. If a person repeats several times a piece of information, he or she has more chances to remember it.

Baddeley's research is of great importance because he found out that short memory abilities influence learning skills: short-term memory is not only useful to remember phone numbers but also to recall the content of a conference and a lecture, which means all what is related to reasoning, problem solving, comprehension, and learning. This is why poor mnemonic abilities lead to

negative results in the academic field and a lot of dyslexic students have to cope with this difficulty during their school years.

Baddeley described the short-term memory like a complex system of mechanisms (see figure 1).

Fig. 1 – Baddeley's three-component model of working memory (1974)



He called this system working memory: it is made of a central executive that organizes the processing of the input, the interaction of the other stores, the activities planning, and the problem solving activities. Furthermore, it is responsible for decision taking. The central executive interacts with the phonological loop that deals with the auditory input, and with the visuo-spatial sketchpad, that is responsible for visual information. The loop interacts with two Brodman areas, 40 and 44 respectively, whereas the sketchpad activates the areas 6,19, 40 and 47 of the right hemisphere. From an anatomical point of view short-

term memory causes just a functional change on a synaptic level (Cassano, Tundo, 2010).

Figure 1 shows that some information may move to the long-term memory, where the human brain can store permanently a great amount of items. Long-term memory is made of several stores: on the one hand there is the explicit memory, on the other hand the implicit memory.

Explicit memory includes both semantic and episodic memory. Semantic memory refers to the recall of linguistic items, such as words and definitions. Episodic memory allows the human brain to remember past events and episodes of a person's life.

Implicit memory is made of several kinds of stores that are invisible. Even if it's not possible to see them, people benefit from its storage system. This type of memory includes procedural memory, priming, conditioning, and habituation.

Procedural memory allows to remember how to do something, priming is the effect of one stimulus that influences the response to another stimulus, conditioning refers to an implicit response to a stimulus elicited more times, and habituation is the reaction of the organism that ceases to respond to a repeated stimulus (Nicoletti, Rumiati, 2011).

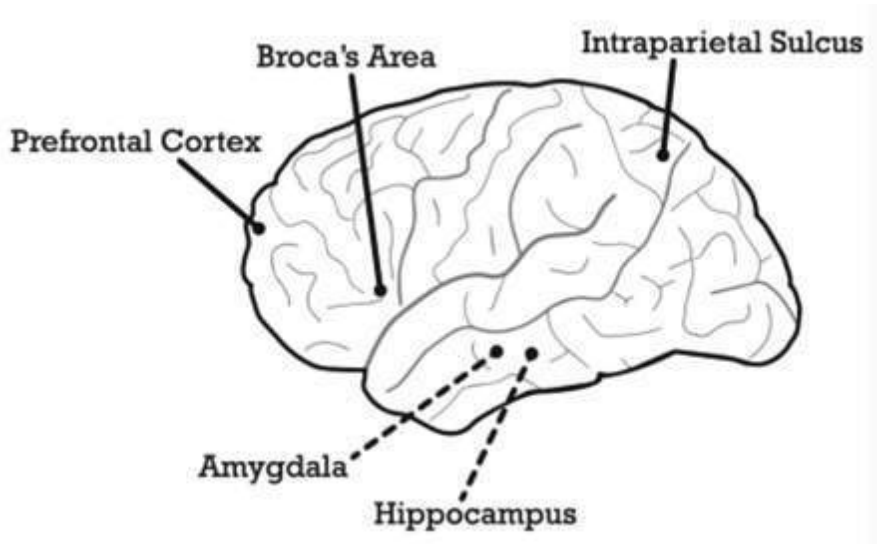
From an anatomical point of view long-term memory storage causes the production of protein chains and permanent changes in some of the synaptic structures of the brain (Cassano, Tundo, 2010).

3.2.1. The anatomical characteristics of working memory

Working memory has been defined like a storage system or a mechanism but neither of these two expressions can give a good description of it. Working memory is first of all a human ability. It is a skill of the brain that allows to work with information and to manipulate it appropriately. It is a conscious mechanism to process information, namely, people who use it give attention to it and can make decisions about it (Alloway, Alloway, 2014).

From an anatomical point of view, working memory requires the working of several areas of the brain. More exactly, it activates a complex system of networks that are interconnected. Figure 2 shows the main areas involved in the functioning of working memory (Levin, Eisenberg, Benton, 1991):

Fig. 2 – Areas activated by the working memory (Levin, Eisenberg, Benton, 1991)



The home of working memory is the prefrontal cortex, namely, working memory is the most important function of this area.

The hippocampus is the storage area of long-term memory. Working memory takes from this area all the most important bits of information relevant to the task at hand. The brain has the ability to select the stored information and to combine it (Alloway, Alloway, 2014).

The amygdala is not only important in emotional processing, it also has an important cognitive function: it is responsible for long-term memory, visual attention and working memory (Schaefer, Gray, 2007). Encoding and storage of memory depend on the functioning of the amygdala that is strictly related to the hippocampal system that forms representations of various kinds of events, namely, hippocampal-dependent memory improves thanks to the action of the amygdala that enhances its function with emotion. As a result of this interaction emotional events are likely to persist in the brain (Phelps, 2004).

Broca's area also takes part in the working memory processes. This area is activated by syntactic complex sentences, namely, the phonological loop is involved in sentence comprehension (Rogalsky, Matchin, Hickock, 2008).

Eventually, the intraparietal sulcus is another component of the working memory system. The precise role of this area is not clear yet: on the one hand some researchers claim that it is responsible for serial order information storage, on the other hand others believe that is has an attentional focalization role (Majerus et al, 2006).

3.2.2 The usefulness of working memory

Working memory has a great amount of advantages useful both in everyday life and, most of all, in the academic context.

A strong working memory allows the university students to prioritize the most important information. At university students have to manage a great deal of emails, texts and notes. Low working memory skills would make it difficult to process and prioritize the most pressing stuff. Hence, working memory is crucial to pay attention to important activities and filter out unimportant events. Thanks to this system it is possible to create a well-organized schedule to plan the academic engagements and to think fast to find the right solution to the disruptions of life. School life and most of all academic life provide the students with a lot of demanding tasks. A strong working memory helps them to inhibit distracting whispering and to deal with multistep activities that require a great amount of the student's attention. Doing more than one task at a time is an ability that derives from a strong working memory and in psychology it is called *task switching*. Task switching may turn out to be very demanding and sometimes it can lead to errors caused by an overwhelming of the brain activities. During the learning process it is not rare that the student has some difficulties in keeping track of where they read or write: a strong memory helps them to complete in the most appropriate way and as quickly as possible the assignment. Actually, a lot of academic tasks require a quick reaction of the student. Lectures have to fit a pre-arranged timetable and exams have a fixed term and the student has to conform him/herself to the academic terms.

Moreover, in the working memory system stays the ability to reinvent one's life. Some people succeed in facing the problems of life, others fail: this difference is related to different mnemonic abilities from one person to another. For example, not all dyslexic students can manage all the difficulties of the university life. For this reason some students abandon the academic life. Probably this depends also on the fact that working memory helps to keep in mind the main goal of one's life. It gives the appropriate quantity of motivation to continue to struggle day by day.

As already written, the working memory activates the amygdala that is responsible for the emotions. This connection involves that a positive attitude helps to concentrate on the academic tasks.

Hence, it is clear that a strong working memory gives a lot of advantages but it is not the only tool that provides success. It is true that it gives a great amount of advantages in school and at university because it is related to good grades but it is also true that good working memory skills are not strictly related to high IQ scores. A strong IQ tells how mentally rich or poor a person is but it does not involve success at school or at university. Whereas IQ depends on the economical conditions of the child's parents, working memory depends on the child's inner abilities. IQ has to do with the parent's educational level because educated parents are more prone to provide more learning opportunities to their child. On the contrary, the working memory abilities are a characteristic of the child that cannot be changed easily. To sum up, IQ and working memory are two important tools to reach success, but they are two independent systems that depend on two different factors: environment influences IQ, genes influence the mnemonic system.

Poor working memory abilities are responsible for low math skills and also difficulties in language learning. In case of memory disorders language learning turns out to be particularly hard in some areas, such as vocabulary learning and grammar. Particularly, it was found out that students have more problems if information is presented too quickly. For example, dyslexic students need more time to process new information and to acquire it permanently. Problems with working memory are an underlying factor in learning disabilities, such as dyslexia, namely, dyslexic students may loose their track while reading. Because of their memory it is hard to keep items in the correct order and, as a consequence, they trouble to identify words and understand texts (Alloway, Alloway, 2014).

3.2.3 The examination of working memory in learning disabilities

In a first moment working memory abilities were examined by analyzing simple memory span: The relationship between mnemonic skills and reading comprehension was not clear.

Daneman and Carpenter's (1980; 1983, in De Beni, 2001) experiments elucidated this topic. They proposed a new method to measure memory: the *Reading* and the *Listening Span Tests*. This test measures at the same time the maintenance of the information in memory and the decoding. For this reason it can give a clear description of the comprehension abilities and their relation with working memory.

Poor comprehenders' problems have been analyzed also by Gernsbacher (1990; 1993, in De Beni 2001) who attributes the deficit to an inhibition difficulty: dyslexic readers are not always able to discern between important and

unimportant types of information. His hypothesis describes the comprehension process as twofold: the reader must have both activation and inhibition mechanisms, which means that a skilled reader has to be able to activate the right information by inhibiting useless items that interfere with the working memory skills. In case of learning disabilities the memory system is overloaded with unimportant information and for this reason important items are likely to be forgotten (Gernsbacher, 1997, in De Beni 2001). Hence, poor comprehenders experience some difficulties in inhibiting irrelevant details.

The same pattern has been noticed in old people: in the reading tasks they are often unable to get the most important pieces of information because they do not inhibit irrelevant items (Hasher, Zacks, 1988, cit. in De Beni).

3.3 Memory processing levels

In 1972 Fergus Craik and Robert Lockhart (1972) proposed an alternative memory model: the theory of the levels of processing. They believed that the quantity of remembered items depends on the depth of the processing. Information can be processed in three ways:

1. Structural processing: if people focus on the form of the word, for example, on the type of letters (has the word capital or lower-case letters?);
2. Phonemic processing: it refers to the sound of the word (does it rhyme with other words?);

3. Semantic processing: it has to do with the role of the word in the sentence (what does the word mean in a specific sentence?).

Craik and Lockhart gave a list of 60 words to three groups of people and each group had to focus on one aspect of that words (structure, phonics or semantics). The researchers observed that an analysis from a semantic point of view creates a deeper processing, namely, people that read the list with a semantic observation had better results. This explains that the semantic level is the deepest one, followed by the phonemic and then by the structural level.

3.4 The mnemonic abilities of dyslexic students

Dyslexia is often associated to poor memory skills even it is still unclear which is the exact nature of this disorder. The first difficulty comes from the description of dyslexia: there is no common definition for this learning disability because it shows different characteristics in each student. The second problem comes from the debate in the study of working memory: the structure and the functioning of the human memory were analyzed for the first time during the 1960s and the research has not come to an end yet.

Some recent research have shown that dyslexics try to face their difficulty by relying on pictures and meanings that help them to recall the items later on. Moreover, after childhood people use the rehearsal strategy to remember information. The rate of articulation determines the memory span: the more words a person can utter in 2 seconds, the better is his or her memory span. Some

dyslexics show a reduced speed of articulation and for this reason they are not able to rehearse a great amount of items.

Shankweiler, Liberman, Mark, Fowler and Fischer (1979, cit. in Snowling, 2006) and Hulme (1981, cit. in Snowling, 2006) observed the relationship between visual and verbal information: dyslexic students are more likely to remember visual items instead of verbal input. Typical developing students are able to remember verbal input for more or less 4 seconds, whereas dyslexics have a briefer duration: this can lead to problems when the student has to follow a list of multiple instructions.

Conrad (1964, cit. in Snowling, 2006) reached one of the first important results in this field. His *phonetic confusability effect* shows that typical developing people find it more difficult to remember words with a similar sound, while it is easier to discern dissimilar words. However, dyslexic readers are not susceptible to this effect, namely there is no difference between rhyming and non-rhyming words. His observation showed a little bit of a drawback because the dyslexic readers' results for non-confusable items were very low. This means that their performance could not be worse with the presentation of confusable items (Hall, Ewing, Tinzmann, Wilson, 1981, cit. in Snowling, 2006).

Unlike Conrad's results, Johnston (1982, cit. in Snowling, 2006) noticed that there is no difference between dyslexic and normal readers: they are equally sensitive to the phonetic similarity. However, the dyslexic's level is the same as younger children reading at the same reading level (Johnston, Rugg, Scott, 1987, cit. in Snowling, 2006). As time progresses, even if the reading problems of dyslexic adults are fully compensated, verbal short-term memory difficulties remain

(Palescu et al., 1996, cit. in Snowling, 2006). This means that the memory deficit cannot be described like a developmental delay: hence, short-term memory problems characterize dyslexic adults (Snowling, Nation, Moxham, Gallangher, Frith, 1997, cit. in Snowling 2006).

The simplest way to describe the memory impairment of dyslexic readers is to say that there is a difficulty in recruiting phonetic memory codes. In other words, dyslexics have an impaired way of representing the phonological form of the lexical items. Because of this impairment the number of verbal items they can retain in memory is lower and this difficulty has knock-on effects in working memory tasks (Snowling, 2006).

However, there are two important keys to reach successful mnemonic results (Hulme and Roodenrys, 1995, cit. in Snowling, 2006): the refreshing of the memory trace and the redintegration for reconstructing decaying memory items. Hulme, Maughan and Brown (1991, cit. in Snowling, 2006) explained these memory processes with an experiment. In their experiment lists of short, medium and long words were administered to some adults. On the one hand they had to recall the items, on the other hand they had to articulate the words in order to measure speech rate. The speech rate task consists in repeating items as fast as possible. The results showed that the memory span for short lexical items is longer and that speech rate and memory span are strictly related: short-term memory abilities depend on rehearsal rate and for this reason speech rate places a constraint on memory performance across development (Hulme, Thomson, Muir, Lawrence, 1984, cit. in Snowling, 2006). Another important characteristic is the lexicality effect, namely, memory for words is far better than memory for non-

words. This happens because long-term memory favors short-term memory performance (non-words do not belong to the long-term storage system and this is why they are more easy to forget). However, it is possible to reconstruct lost memory traces: the missing phonetic item can be filled in by drawing upon knowledge of words that are similar from a phonological point of view. This is an effective strategy for high-frequency words that play a significant role in memory. Hence, the problems that dyslexic students experience with their memory skills are influenced by their speech rate and by the ability to draw upon long-term memory representations (Snowling, 2006). As a consequence, word finding becomes a really hard task for dyslexic students because naming tasks need the ability to retrieve a verbal label from long-term memory.

The first researchers who analyzed the diagnostic importance of naming problems were Denckla and her colleagues (Denckla, Rudel, 1976a and b, cit. in Snowling, 2006).

There are different ways to examine the naming skills of dyslexics: confrontation naming and naming to definition. The first way consists in showing a picture and asking for its name, while the second technique consists in giving a description of an object and asking for its name.

Generally speaking, dyslexic people show more difficulties than typical developing people, especially with low-frequency and polysyllabic words (Katz, 1986, cit in Snowling, 2006). Snowling, van Wagtendonk and Stafford (1988, cit. in Snowling, 2006) continued the research in this field: the results of their research show that dyslexics experience more difficulties in the naming tasks but they do not differ from younger controls. Moreover, people with dyslexia

perform as well as controls on the receptive vocabulary test that consist in matching pictures and words. However, they have some difficulties with the picture naming test. These results show that for dyslexics it is not easy to retrieve the names of objects with which they are familiar and there are different theories to explain this deficit: some experimenters believe that they have a week phonological representation of the word in memory. This hypothesis is supported by the fact that their mistakes are phonologically related to the targets. For example, instead of saying *ladybird* they may say *babybird*: hence, there is a high proportion of phonemes shared between target and error (Nation, Marshall, Snowling, 2001, cit in Snowling 2006). Reading disabled students who show phonological deficits also show naming-speed deficits (Waber, Forbes, Wolff, Weiler 2004, cit. in Nicolson and Fawcett, 2010): this result shows how different problems are related to each other.

3.4.1 Baddeley's new memory model

In order to describe the relationship between dyslexia and working memory, it is important to consider the latest version of Alan Baddeley's (2000) working memory model because more than one mechanism is involved in case of dyslexia: in this updating he adds the episodic buffer, an element that completes the system of his first memory model. Until recently, the central executive had not been completely investigated in relation to dyslexia. It was just an element of the memory system and it's role was not clear with respect to dyslexia. It was considered the storage system that kept information in memory and that

manipulated information. In a first moment Baddeley claimed that it controls and regulates the whole working memory system, but after the inclusion of the episodic buffer he concluded that the central executive is responsible for attention, namely, for focusing, switching, dividing and inhibiting attention. Furthermore, it's the episodic buffer that interfaces with long-term memory and not the central executive like previously believed. The episodic buffer is controlled by the central executive and can be described like a temporary storage system that has a limited capacity. It is called episodic because it integrates information across space and time in a multi-dimensional code.

One of the elements of Baddeley's working memory model that is responsible for reading disabilities is the phonological loop. The phonological loop is characterized by two sub-components, namely, the phonological store, that holds information for a limited amount of time, and the phonological rehearsal process, that refreshes the contents and lengthens the duration of the trace. Nowadays, it is still unclear where exactly the dyslexia-problem lies. It lies either in the storage processes or in the rehearsal processes. It could be that the disorder is caused by a general phonological processing deficit. On the contrary, dyslexic students do not show difficulties with the visuospatial sketchpad, hence, with the visual memory. The sketchpad can be divided into two sub-components too: one element deals with information of a static visual kind and the other element deals with information of a dynamic spatial nature.

A part from the phonological loop the central executive may also be involved in learning disabilities. It was Swanson (1994) who found out that storage and processing are two fundamental mechanism for reading recognition. His research

shows that memory deficits are not only related to storage problems but they may be related to more than one factor. Other surveys have demonstrated that the central executive plays an important role because in the case of dyslexia it shows a problem even if there are no articulation problems. This means that problems with the central executive do not depend on poor articulation rate skills. In some cases both central executive and phonological loop may be damaged, in other cases they are not related.

Palmer (2000) proposed that the central executive is important to develop literacy because in this mechanism there is the inhibition of the visual processing strategies that favor the phonological strategies during the reading activity (Alloway, Gathercole, 2012).

The relation between poor memory skills and the phonological loop was explained by Baddeley (1966) and Conrad & Hull (1964) who focused on the phenomenon of the *phonological similarity effect*. They observed that a list composed of letters with similar codes is harder to remember than a list of letters with different characteristics. Moreover, another explanation of the importance of speech-based codes is the unattended speech demonstration: speech background noise can impair to recall lists. This happens because unattended speech enters the phonological loop bothering the memory task. Memory is also influenced by the length of the words that have to be remembered: the longer the word the harder the task. It is not the amount of syllables that influences memory but the spoken duration of the word.

3.5 Memory examination

As already mentioned dyslexic students may encounter some difficulties with their memory skills, not only in everyday life but also in the academic context. The first step to face this problem is to examine the characteristics of this disorder with the appropriate tools. The student's mnemonic skills can be examined through a clinical interview or a test (Cassano, Tundo, 2010).

Some tests commonly used to asses memory are the *Mini Mental State Examination* (Folstein M.F, Folstein S.E, McHugh, 1974, Measso, 1993), the *WMS-R: Wechsler Memory Scale Revised* (Elwood, 1991), and the *MAS: Memory Assessment Scale* (Williams, 1981). These tests have a little bit of a drawback because they were created to assess the memory skills of brain-injured people and not specifically of dyslexic students.

The *Mini Mental State Examination* aims at scoring cognitive abilities. It is short, namely, its administration requires from 5 to 10 minutes. Generally, it is used to examine patients with dementia syndromes, affective disorder, mania, schizophrenia, and personality disorders. It is made of 30 questions that aim at examining the following areas: place and time orientation, vocabulary, attention, calculation, memory, language, and praxia. The minimum and maximum scores are respectively 0 and 30 and a patient gets good results if he scores more than 26. A score lower than 18 reveals a severe cognitive disorder.

The *Wechsler Memory Scale* is the most used scale to estimate adult mnemonic skills but it provides just a rough evaluation of overall memory skills. It is composed of seven subtests and it is possible to administer the test to different

clinical groups. It is a short battery that focuses on several areas, such as place and time orientation, attention, concentration, logical memory, repetition of numbers, reproduction of geometric figures and word learning. Its result gives the memory quotient of the patient.

Eventually, the *Memory Assessment Scale* is composed of 12 sub-tests and it assesses memory working in two kinds of population: clinical and normal. It assesses several areas, such as attention, concentration, short-term memory, learning, immediate memory, and memory following a delay.

Apart from these tests, there are more specific tools that can be used: the serial repetition of disyllabic words test (Spinnler, Tognoni, 1987, cit. in De Beni 2001) and the Corsi's test (De Renzi, Nichelli, 1975; Spinnler, Tognoni, 1987, cit. in De Beni 2011) to measure the short-term memory, the serial position test (Spinnler, Tognoni, 1987, cit. in De Beni 2001) for long-term memory and the Listening Span Test (Pazzaglia, Palladino, De Beni, 2000, in De Beni 2001) for working memory.

The serial repetition of disyllabic words test consists of an input of words that the listener has to remember in the same order as he or she heard them. The words are read one every two seconds. There are different levels, and in each level there are three lists of words. If the listener can recall two out of three lists he can go on with the next level.

Corsi's test is based on the visual field. There are nine cubes on a wooden table and on the back of each cube there is a number that only the experimenter can see. Every two seconds the experimenter touches a cube and creates a visual list that the experimentee needs to remember. The watcher has to recall the right sequence

and show it by touching the cubes. If the watcher is able to remember two out of three lists then he can go on to the next level.

The serial position test consists in reading a list of twelve words that the listener can remember in any order. He or she will hear one word every two seconds. The first words of the list can be remembered thanks to the long-term memory, the last words thanks to the short-term memory skills. Hence, this test is useful both for short and long-term memory.

The Listening Span Test is made of a tape in which some sentences have been recorded. The experimentees read or listen to series of 3, 4, 5 or 6 sentences. The first activity is to answer a question, namely, to decide if the sentences are true or false. The second task consists in remembering the last word of each sentence. The sentences are grouped in lists from two to six.

The results of this test are given on the one hand by the number of correct true/false answers, on the other hand the number of final words correctly remembered.

This test was first created by Daneman and Carpenter (1980) and Pazzaglia, Palladino, and De Beni (2000) readjusted it for the Italian language. They noticed that there is a relationship between comprehension skills and working memory. Good memory abilities favor a clear text comprehension and there is no learning without memory.

An important priority of the school system is to identify children with dyslexia as soon as possible, which means before they fail to learn to read. For this purpose there is the DEST for native English-speaking children (Fawcett & Nicolson, 1995a; Nicolson & Fawcett, 1996, 2004b, cit. in Nicolson, Fawcett 2010). It is a

30-minute, age-normed, screening-test made of 10 sub-tests that examine those skills that can be considered positive indicators of a learning disability. This test is specifically for children between 4.5 and 6.5 years and it can be administered to examine a wide range of difficulties: from learning disabilities to low social and economic status background. The DEST examines several areas, such as phonological skills, naming speed, motor skills, balance, auditory processing, accuracy of shape copying, reading abilities, visual memory and lexicon. The result of the test is an At-Risk Quotient (ARQ).

The DEST is fundamental not only to identify dyslexic students but also to create the appropriate intervention program for his or her weaknesses.

The first screening test for the Italian language was published just in 2013 and it is called SPEED test (Savelli, Franceschi, Fioravanti, 2013). It aims at finding out as soon as possible at risk situations in order to create the appropriate intervention program. It is composed of three subtests that can be easily administered by teachers, psychologists, speech language pathologists and/or child neuropsychiatrists. Little children have to be tested in two different times: after the end of the first semester (January/February) and at the end of the school year (May/June). The first test is a phonemic test that aims at investigating the child's skills to recognize the sounds of the letters, the second one is a naming test and the last part is made of a writing task, which means that the child has to write a letter on a page. The whole test lasts more or less 10 minutes.

Even if the dyslexic student has already been assessed, he or she should continue to test his or her mnemonic abilities. For this purpose there is the Wechsler Adult Intelligence Scale (1981, cit. in Farmer, Riddick, Sterling, 2002; Orsini, Laicardi,

1997) that is a digit span test: the testee has to read back sequences of digits by paying attention not to invert the correct order. Generally speaking, it is known that dyslexics have shorter digit spans but the difference between dyslexics and control groups decreases in adult literature (Hanley, 1997, Hatcher et al. 2002, cit. in Farmer, Riddick, Sterling, 2002).

3.6 Memory disorders

All the types of memory are important, particularly for a student, because the stores interact in order to move information from one area to another. An impairment in one of these systems may cause learning difficulties, creating a lot of troubles in the student's future academic life. For example short-term memory problems may cause words misreading. Working memory disorders are responsible for confusion in long-term storage: the student won't be able to decide which information should go into long-term storage. Moreover, poor working memory skills cause a bad remembering of the sounds of the words so that it will be difficult to blend individual sounds into words. Weak working memory skills are often a common symptom of dyslexia, namely, dyslexics tend to forget oral instructions. Hence, it is the auditory sphere that appears to be particularly problematic for them. The visual memory too may cause some problems in some dyslexic students because magnocells, the neurons responsible for events synchronization, are impaired in the dyslexic brain (Lawrence, 2009).

Long-term memory disorders are characterized by the inability to acquire permanently new words because as soon as the student learns them, he forgets them (Gopal, 2013).

Hence, memory disorders are one of the worst enemies for a university student. To forget a date, a definition or an event may have serious consequences on the result of an important exam.

A part from the previously mentioned impairments there can be many external causes why a student's memory is disadvantaged. For example, students are likely to forget something because of information overload, time constraints, stress, retirement, and pain.

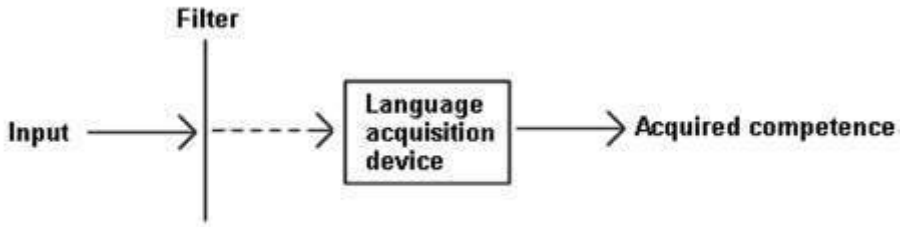
Distraction characterizes the university student's life because they have to focus on many tasks at the same time: students are expected to have multitasking skills but an exaggeration in the quantity of activities may overwhelm the student's working memory (Alloway, Alloway 2014).

3.6.1 The affective filter

It is clear that the learning process is strongly affected by the memory skills of the student. Weak mnemonic abilities are likely to create a difficult learning context but a part from the individual difficulties, it is important to take into account also the interpersonal and intrapersonal problems that may arise in the classroom during a lecture. The second language acquisition process is namely strictly related to some affective factors. Anxiety, low self-confidence and low motivation are responsible for the activation of the *affective filter* (Krashen,

1982): the affective filter is an invisible psychological filter that hinders language acquisition and, as a consequence, the memorization of new contents. Fear is responsible for the production of a steroid that blocks noradrenaline. This reaction stops the working of the amygdala and of the hippocampus hindering the delivery of language input to the language acquisition device like shown in figure 3:

Fig. 3 – The role of the affective filter in language acquisition (Krashen, 1982)



In order to avoid the effects of the affective filter it is fundamental to have a strong motivation, a positive self-image of one's own personality and low anxiety levels. These factors can be improved in the classroom by adopting a humanistic approach that takes into account the needs of the students.

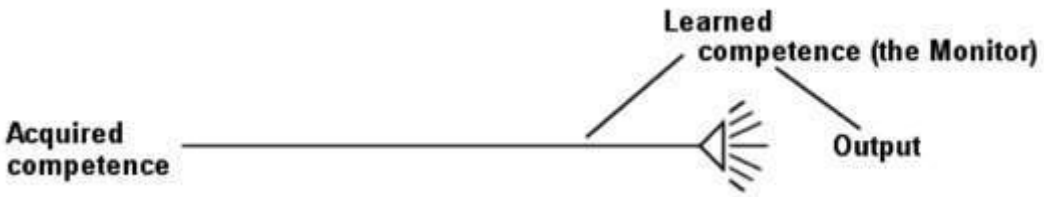
In 1982 Krashen published his *Second Language Acquisition Theory*, composed of five hypotheses.

1. Acquisition and learning are two different kinds of competence. Language acquisition is a subconscious knowledge, namely, the students do not know explicitly that they are acquiring language. Language learning is a conscious process that brings the student to be aware of the rules and to be able to discuss about them. It could seem that children acquire and adults

learn. Actually, adults are also able to acquire language because the ability to memorize implicitly language does not end at puberty;

2. Students acquire the grammatical structure of a second language in a predictable way: some grammatical structures appear early, others in a second moment;
3. The language system has a monitor function that checks the form of the utterances. The monitor is an explicitly learned function important for the self-correction and for the production of an acceptable linguistic output, like figure 4 shows;

Fig. 4 – The influence of the monitor function on the linguistic output (Krashen, 1982)



4. The learning process has to follow the *i + 1* pattern. Before moving to a more difficult level, the student has to understand the meaning of the starting input;
5. Students learn better if they do not have to face the effects of the *affective filter*.

Summary

Memory is the human ability to encode, store and retain information. The interest for the mnemonic abilities began at the end of the XIX century with Ebbinghaus and continued with many researchers who tried to describe the working of the brain mnemonic skills and its structure. Waugh and Norman are just the first of a long list of researchers who tried to give a clear picture of this complex system.

Memory can be described as a complex system because it is composed of several stores: sensory store, short-term memory, and long-term memory.

Every kind of memory involves the functioning of a specific area of the brain: for example, the working memory, a short-term store responsible for the interaction of the other stores, the activities planning, and the problem solving activities, activates prefrontal cortex, Broca's area, intraparietal sulcus, amygdala and hippocampus.

An injury or a genetic problem, like dyslexia, in one of these areas may be responsible for weak mnemonic abilities and poor memory skills are a great drawback for university students.

In the academic life first, and at the workplace later on, a dyslexic may experience great difficulties because of his or her low memory abilities. In order to turn language learning into language acquisition, a strong mnemonic system is required.

Early intervention can solve some of these difficulties: a well organized teaching program and the appropriate learning strategies may be a good support for dyslexic students.

Most of all, it is important to avoid raising the affective filter so that the student can turn language learning into language acquisition.

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IV

The framework of language: the lexicon

4.1 A definition of lexicon

Memory plays an important role in language acquisition because mnemonic skills are fundamental to widen one's lexicon: the stronger the memory is, the wider the vocabulary grows.

Vocabulary can be defined as the supporting structure of language. Every word is like a building block and by putting more blocks together it is possible to create a complex building, that is a sentence (Denes, 2009).

Roughly speaking, the vocabulary is the mental dictionary of the speaker, composed of a set of words. It is not only hard to define vocabulary but also to explain in a clear way what a word is. From an orthographic point of view a word is a group of letters separated from another chunk of letters. Sometimes a word may carry a hyphen or an apostrophe. Semantics gives another kind of definition: a word is the smallest unit of language that carries a meaning. Another point of view sees words like units that stand on their own. A structural description sees the word like a unit composed of morphemes.

All the previous mentioned descriptions do not give a univocal description for word. For this reason the neutral term lexeme (or lexical unit) was introduced to give a complete and coherent description of it. A lexeme is an abstract unit that

can take different forms: inflections, polysemous and multi-word items are lexemes (Takač, 2008).

Words are related to meanings, namely, every word is a verbal signal for one or more things and concepts. The vast majority of words are arbitrary, which means that there is no reason why they have a specific meaning. The only reason is that people agree on that meaning and in order to understand each other they use the appropriate verbal signal to convey a specific meaning. Hence, people are not free to use invented words if they want to communicate. They need to know the right code and its lexical items to enter the communicative network of society.

Moreover, a skilled speaker has to be aware of the different types of meanings that a word may have: on the one hand there are denotative meanings, on the other hand connotative meanings. Formal definitions that describe the quality of the word belong to the former type, the meaning that refers to the link of the word to other ideas belongs to the latter (Moats, 2010).

4.1.1 The structure of the words

Every word carries more than one type of information, namely, a word has at the same time:

1. Semantic information: it has a precise meaning;
2. Grammatical information: it belongs to a grammatical category. For example, it can be a noun, an adjective, an adverb, a verb and so on;

3. Morphological information: it has an internal structure, made of morphemes. There are either simple words or complex words (complex words can be split up in smaller parts);
4. Phonological information: every word is composed of a specific combination of sounds;
5. Orthographical information: in the word there are a set of graphemes.

Moreover, words can be divided into two subgroups: open and closed word classes. Nouns, verbs, adjectives and adverbs belong to the former subgroup, whereas articles, pronouns, prepositions and conjunctions belong to the latter type. The open class is characterized by words that may change and it is possible to add or remove words from this class. On the contrary, the closed class has a limited number of words and doesn't change (Moats, 2010).

This description shows that a word is more than just a word. It is a combination of little chunks that merge to create a whole with a specific meaning and function. Every word has its story and the knowledge of its origin is an important tool to understand its role. Etymology is the science that studies the original meaning of the words. The reader that analyzes the words from an etymological point of view deals with the deep structure of the item that represents a metaphor, that is a picture of the story of the word (Funk, Lewis, 1991).

Etymology is like a genealogical tree because it tells the story of the word: words belong to families, namely, they are not isolated items. The relationship between two words represents the hierarchical structure of the lexemes: the relationship can be either superordinate or subordinate. For example, the word *body* is the

umbrella term under which *knees* and *shoulders* fit and therefore *body* is the superordinate category (Moats, 2010).

4.2 The development of vocabulary in L1 and in L2

As a rule, English adult speakers know more or less 50.000 words of their mother language (Levelt, 1989). The vocabulary of an Italian adult speaker has a similar pattern: it is made of more or less 25.000 / 50.000 items. To understand a common usage text readers have to know 7000 words. 2000 items are commonly used words, such as *beautiful, dog, and water*. 2.700 are frequently used words and 2.300 are high availability words, namely, items that the speaker uses but not as frequently as the commonly used words.

However, vocabulary skills cannot be measured with numbers only. A qualitative description is important too. Vocabulary abilities depend on the semantic, morphologic and syntactic knowledge of the words. (Diadori, Palermo, Troncarelli, 2009).

Vocabulary development is a quick process that starts at one, when the little child understands more or less 10 words and produces an average of 50 words. It grows day by day and at six the child's lexicon has more than 10.000 words (Denes, 2009). In the case of L1 the source of vocabulary acquisition is the incidental learning from a lot of different contexts. Children have a large amount of L1 input that enables them to widen their lexicon. Adult L2 learners have more difficulties because they rarely can benefit from a large amount of input.

Moreover, the acquisition of L2 vocabulary in adulthood is not the same as L1 lexicon acquisition also because an L2 speaker has richer background knowledge. The speaker has already acquired the functioning of the L1 and therefore he or she uses an existing pattern to learn a second language. Obviously, L2 vocabulary acquisition depends on the similarity between L1 and L2. There might be either a positive or a negative L1 transfer effect (Takač, 2008). Ringbom (2007) observed that at early learning stages students focus on the form of the new word and not so much on its function or meaning. This is why they interpret the new word by observing just its formal similarities. He called this *equivalence hypothesis* because students interpret an L2 lexical item by comparing it to an existing L1 word. However, his technique may lead to mistakes because not all lexical units are exactly equivalent and even if they are equivalent in every language they can have different grammatical contexts. Moreover, equivalents can be either false friends or they may belong to different classes. This means that in some cases there are no pure equivalents between L1 and L2 (Swan, 1997).

It is also important to notice that L1 vocabulary recalling is not exactly the same as L2 vocabulary recalling. However, not all the researchers have the same opinion. Actually, a lot of researchers claim that L2 learners seldom use semantic associations. Semantic associations are more frequent in L1 vocabulary recalling. L2 students prefer phonological similarity, hence, the form precedes the meaning of the word. Other researchers believe that just low-proficiency students prefer phonological strategies, whereas high-proficiency students rely more on semantics. In the truth, both processing techniques are useful: learners rely more

on phonics in the initial stages, while they prefer semantic processing in the advanced stages (Takač, 2008).

Thornbury (2002) focused on the importance of memory in vocabulary acquisition and made a list of principles useful to store new words in long-term memory. In order to remember a lexical item, the reader has to encounter it a lot of times and it is better if it happens at spaced intervals. Moreover, the affective factors play an important role in the memorization of new items (Takač, 2008).

Vocabulary may turn to be the secret of success: namely a great vocabulary improves the chances of success in the academic context and at work. High intelligence levels are strictly related to the vocabulary development because "*words are the tools of thinking*" (Funk, Lewis, 1991:4). The thinking is clearer if a person has more words at his or her command and learning power is stronger with a wide vocabulary knowledge of the language.

4.2.1 The interlanguage theory

In the foreign language acquisition process the student reaches his or her final aim step by step. Before reaching proficiency learners do mistakes because they try to manipulate language and they create a language system, called interlanguage, that is not perfect. Hence, errors made by students are not a negative side effect of the learning process. Errors show that the student is making some efforts to organize the linguistic items and they clearly show that the student's language system is developing.

Selinker (Selinker, 1972) is the originator of the interlanguage theory. He believes that interlanguage is the result of five processes:

1. Language transfer: the student may compare the form of an L2 word to an already known L1 word even if there is no semantic similarity between them;
2. Transfer of training: the learner uses his or her knowledge in one area to solve a problem in language output;
3. Strategies of learning: the type of strategy that the student uses influences his or her improvement in communication skills. Learning strategies are on the one hand conscious, on the other hand unconscious;
4. Strategies of communication: sufficient communication skills may have negative effects if the student is able to communicate in an acceptable way. The learner may decide to cease to develop his or her interlanguage because he or she believes to have good communication skills. This lack of motivation may lead to fossilization.
5. Overgeneralisation of linguistic material: the approach to the materials they use to learn has a great influence on the output skills.

4.2.2 Vocabulary recalling and dyslexia

In the early 1970s Denckla (1972) observed that people with dyslexia have some problems with word recalling. Levelt, Roelofs and Meyer (1999) proved his hypothesis with the two-step model: in the word retrieval process people with dyslexia experience difficulties just in the second step, namely, the phonological

process. In the first step, namely, in the semantic representation, they encounter no difficulties. Hence, it is just the phonological encoding that represents an obstacle. The impairment in step two is responsible for mispronunciations, circumlocutions, and pauses that create a disrupted language output. This kind of problem persists into adulthood. Hence, word recalling requires more efforts in case of dyslexia and it is not always a successful process (Shaywitz, Shaywitz, 2013).

4.2.3 The semantic memory

It was Tulving (1972) who first found out the connection between long-term memory and vocabulary: he divided this store into semantic memory and autobiographic memory. The latter is responsible for the recalling of personal events. The former is a mental register in which the human brain organizes and stores words, verbal symbols, and meanings. The semantic memory tells what a person knows and it is strictly linked to the language knowledge. It differs from the episodic memory because episodic storage implies remembering: remembering depends on knowing but knowing does not involve remembering. This is the reason why episodic and semantic memory differ and the episodic memory abilities lag behind the semantic storage processes. The relation between these two stores shows that information needs semantic memory in order to enter episodic memory (Tulving, 2001).

Today the semantic memory includes also a general knowledge about animals, implements, and good behavior even if, from an anatomical point of view, this

kind of knowledge lies in different systems, namely, in the medial temporal lobe and in the diencephalic structures (Denes, 2009).

The semantic memory is a kind of declarative memory. It is large, complex, unlimited, and its store is easily accessible. Sometimes, it is sufficient to have a meaningful and short contact with the new word to add it to the memory store because the new item has truth value. Its store is open to multimodal input, namely, different sensory modalities contribute to the storage of new meanings (Tulving, 2001).

4.2.4 The models of the semantic memory

The semantic memory has been a topic of great interest for many researchers. The three main models that give a description of this storage process are: the network model, the set-theoretic model and the feature-comparison model.

The network model (Collins, Quillian, 1969) sees the semantic system like a huge network where items are connected by links. Collins and Quillian's model has been criticized a lot because they do not explain why people answer faster to questions that do not have such a strong semantic relationship, for example MAMMAL and ANIMAL, and are quicker with couples like COLLIE-ANIMAL.

The set-theoretical model (Loftus, Loftus, 1976) describes memory as a system composed of sets of elements. Every item in memory has two sets: on the one hand the set of categories that intersect with the word and on the other hand the set of characteristics that belong to the item.

Smith, Shoben and Rips (Smith et al., 1974) developed the feature-comparison model that represents the items of memory as a set of semantic characteristics. At a glance, it could seem that this model and the set-theoretical model are the same but they are not. There are two kinds of features: essential characteristics of the item (defining features) and characteristic features, namely, features that describe the item but do not form part of the word definition. For example, the description of the word ROBIN involves on the one hand the explanation of its essential aspects, such as "it is a living animal", "It can fly" and "It has red feathers", and on the other hand the enumeration of its secondary characteristics that are useful to describe the ROBIN but are not its primary features, such as "It lives on the trees", "It is a small animal" and so on.

When a person hears the word ROBIN, sometimes he or she has to accomplish two steps in order to verify if it is a member of a specific category (is the ROBIN a bird?):

1. It is necessary to compare defining and characteristic features of the item to see if the two sets are similar. If the feature similarity is high the person can easily answer yes. If there is low correspondence the person can answer no;
2. In some cases a further step is needed to take a decision. This happens when there is an intermediate grade of similarity between defining and characteristic features. In this case a comparison between defining features of the category and of the instance are needed.

However, the feature-comparison model has been criticized because it is not easy to decide which feature is really defining and which one is characteristic: it is a

hard task to say if a specific feature is absolutely necessary to define a word. A table with three legs will always be a table, even if it has a different characteristic. The same happens with the robin: without feathers it still remains a bird, even if an important defining features is missing (Collins, Loftus, 1975).

4.3 The organization of the mental lexicon

An interesting characteristic of the human brain is the way it organizes the mental lexicon. It does not work like a paper dictionary but it stores the items according to initial phonemes, suffixes and stress. A part from a structural organization, the mental lexicon follows also a semantic arrangement by associating with coordination and collocation. Hence, the words have a three-dimensional placing: phonology, orthography and semantics cooperate. However, receptive and productive vocabulary are not strictly linked, namely, they depend on different mental processes.

Productive vocabulary and receptive vocabulary have different sizes: productive vocabulary is not as large as receptive vocabulary. Moreover, receptive vocabulary comes first, whereas productive vocabulary needs more time to come out (Takač, 2008).

Morton (1970) was the first researcher who analyzed the mental lexicon. He proposed a simple model called multicomponential. From his point of view the decoding of information follows a serial pattern, namely, every item is elaborated first at the semantic level, than at the lexical level and at last at the phonological level.

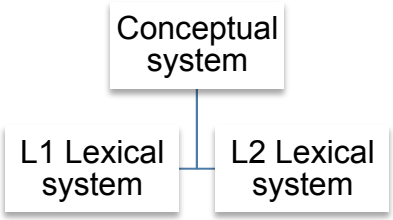
Levelt (1989) continued the research and described the process of articulation from its beginning: the recalling, the analysis of its syllables and its articulation. The first step is the recalling of the headword, by taking into account the category and the variations in every grammatical context (the same word may be feminine, masculine, singular and/or plural). In a second moment, there is the activation of the lexeme from a phonological and morphological point of view.

Another model is the interactive one (Dell, 1986) that describes the vocabulary retrieval process like a network of knots: there are phonological, semantic, and lexical knots. The activation of a knot depends on how strong the connection is and on its decay. The naming process starts with the activation of semantic networks that stimulate the lexical process and in the last step there is the activation of the phonological knot.

The interesting results in the mental lexicon field were reached thanks to modern neuroimaging techniques applied to people with brain injuries, such as aphasics. Their productions were analyzed in different contexts by providing them different kinds of stimuli. For example, researchers observed how the word class or the modality of the stimuli influence the recalling (Denes, 2009).

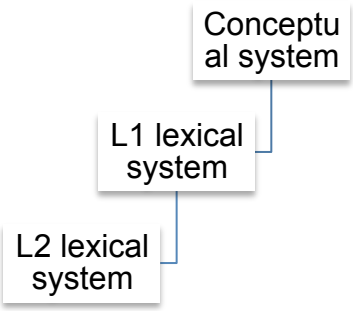
The organization of the mental lexicon varies according to the age of acquisition of the second language (Brauer, in Healy, Bourne, 1998; Pavlenko, in Fabbro, 2002; Abel 2003). Early bilinguals (people who learn a second language before being eight) put L1 and L2 lexicon in two different stores that are directly linked to the conceptual system (see figure 1).

Fig. 1 – The lexical system of the early bilingual (Abel 2003)



On the contrary, the conceptual system of late bilinguals is directly linked just to their mother language. The lexical system of L2 has to activate first the L1 lexical system and then the conceptual system (see figure 2).

Fig. 2 - The lexical system of the late bilingual (Abel 2003)



In this second case, it is clear that there is no connection between the L2 lexical system and the conceptual system and for this reason the L2 vocabulary recalling is more difficult.

4.4 Lexical disorders

Vocabulary recalling is not always in working order. There are several factors that influence vocabulary recalling (Denes, 2009):

1. Age of acquisition: the earlier the word was acquired, the better the mnemonic system stores it;
2. Concreteness: abstract words are more difficult to remember;
3. Word class: there is a dissociation between the recalling of verbs and of nouns;
4. Emotiveness: words with a high emotive value are easier to remember;
5. Effectiveness: words that refer to something practical have a strong storage;
6. Type of presentation: visual, tactile or auditory modality influence the recalling in different ways.

Two types of mistakes may happen when people have problems with the vocabulary recalling. Paraphasia is a signal of weak lexical recalling abilities and it can affect either phonemes or semantics (Denes, 2009):

1. Phonological paraphasia: it is characterized by omissions or substitutions of the phonemes of the word or by neologisms;
2. Semantic paraphasia: in this case phonemes are preserved but there are problems with the meaning of the word that can be inverted with the semantics of another lexical item.

In the Landmark College of Putney incoming students with language learning difficulties are assessed with a semantic network exercise (see table 1).

Tab. 1 - Semantic network exercise (Moats, 2010)

Arrange the following words into categories as quickly as you can. Do not add any words or leave out any words (Time limit: 10 minutes).								
Paper	Maple	Rope	Bark	Softwood	Beams	Pine	Axe	Hardwood
Mulch	Oak	Chainsaw	Paneling	Birch	Root	Kindling	Parts	Branch
Truck	Needle	Guitar	Skidder	Products	Trees	Spruce	Mahogany	Leaf
Trunk	Tools							

The exercise asks them to organize some words in a hierarchical structure: a good organization is a signal of a rich vocabulary (Moats, 2010).

4.5 The role of the teacher in vocabulary teaching

As seen in chapter 2 the teacher can choose between a vast variety of teaching approaches in the lecture. For example, the naturalistic approach has been a common teaching method in the last few years. It favored implicit and incidental learning of vocabulary, namely, the students had to guess the meaning from the context. Moreover, inference skills were considered of great importance for a student. Actually, this approach is not as useful as it seems, namely, an implicit and incidental learning process is slow and inefficient and it does not store new words in long-term memory because vocabulary acquisition has to be controlled (Soekmen, 1997). Hence, a good strategy is to teach vocabulary from the very beginning in an explicit way. Teaching vocabulary does not mean to explain the words as if they were grammar rules, but to make clear which vocabulary learning strategies the students should use. Hence, the teacher has to know how to present new lexical items and students need to learn how to learn (Hatch, Brown, 1995).

Good vocabulary skills are particularly important to become proficient readers: the more words a reader knows, the better he or she deciphers a text (Moats, 2010).

4.5.1 The Lexical Approach

The first famous researcher who gave great importance to the vocabulary teaching was Michael Lewis (Lewis, 1993). He developed the Lexical Approach that focuses on the importance of words and multi-word combinations: they are considered the building blocks of the language acquisition process.

Grammatical structures are in the background of the language system, while lexical units are in the foreground. Words have to be analyzed in context, by taking into account their collocations because every chunk has a specific way of combining. Lewis' theory is based on the idea that language is made of chunks: it is the recalling of chunked input that favors fluent speech. Chunks play an important role because they are grammaticalized lexis and students need to know them to improve their second language learning process (Richards, Rodgers, 2014). Chunks are units that the human brain remembers as if they were prefabricated words: they are stored and recalled as a whole. On the truth, there is no wall between grammar and lexis: on the contrary, it is a continuum and many lexical items belong both to lexis and syntax (Ma, 2009).

4.5.2 The presentation of new words

There are several ways to teach new vocabulary. In the most cases learners are passive recipients that have to fill in a way or in another their own brain. The teacher has the important role to turn them into active participants.

Some examples to present new lexicon are the following:

1. Association between L2 item and L1 equivalent word: this strategy is particularly helpful to show the differences between the two languages. False pairs, connotations and sociolinguistic rules may cause some important input or output mistakes (Takač, 2008);
2. Imaginary associations: it is not rare that the university student is forced to remember a great amount of unconnected data. The first step that the student can do is to form associations that do not really exist but that can be useful to remember. Mnemonics helps the student to transform, store and retrieve data in long-term memory that has been stored thanks to imaginary connections (Trudeau, 1995, in Birsh, 2011);
3. Definition of the L2 word by using synonyms, antonyms, or examples that describe its function or characteristics;
4. Description of the word in context: in this case the learners have to guess the meaning of the word by taking into account the contextualized lexical item;
5. Connection of the meaning to real objects: this strategy is used with beginners and it consists in demonstrating realia and using visual aids;

6. Involvement of students in presentation: learners are actively involved to find out the meaning of the word from its form (Takač, 2008);
7. Creation of a semantic network: related ideas may help to remember items that belong to the same topic;
8. Teaching of denotative and connotative meaning of the new word: frequently used words may have multiple meanings and, in order to become a proficient L2 speaker, it is important to know as much as possible of the word;
9. Teaching of idioms and metaphors: fables, poetry and songs may be useful tools to teach new words in an artistic way (Moats, 2010).

The form can be presented in several ways too:

1. Oral drills: they are a listen and repeat activity, namely, the teacher utters the word and the learners have to repeat it aloud;
2. Phonetic transcription: the word can be presented from a graphic point of view by writing its sound transcription;
3. Graphic form presentation: the word can be presented in its written form by writing it on the board or by highlighting it in the book;
4. Spelling: learners who can spell the word are more prone to memorize its written form (Takač, 2008).

Recent acquired words need to be reviewed and consolidated in order to store them in the long-term memory. Actually, the "expanded rehearsal" theory (Schmitt, 2000) claims that new items have to be reviewed immediately after the first presentation and then at gradually increasing intervals. The following

solutions are some of the strategies that a student may use to consolidate new words:

1. Repetition: a mechanical repetition is not the best solution to memorize but it may turn out to be useful;
2. Copying: words copied on cards with pictures can aid the memorization process;
3. Manipulation: the matching of a word and its definition or grouping techniques may help the student to acquire the new item;
4. Association: to link the meaning of an already known word with that of the new one can be a good strategy to create a meaningful and organized vocabulary memorization process;
5. Semantic processing: semantic links can create interesting networks that allow to elaborate the new word at a deep level;
6. Mental processing: the creation of diagrams and illustrations is useful to create mental images;
7. The use of realia: to personalize means to make the learning materials effective;
8. Word identification exercises: word puzzles or crosswords help the learner to focus on the form of the word;
9. Analysis of the word structure: the activities that focus on the word formation process and that highlight its grammar forms favor memorization;
10. Practice: all the output activities that require a productive use of vocabulary are useful;

11. Variety of tasks: last but not least, the most important strategy is to offer as much learning opportunities as possible. Several tasks of different types provide an adequate lexical knowledge (Takač, 2008).

To conclude, there is not just one strategy to improve one's vocabulary knowledge but there are a great variety of methods that can help the learner to memorize the new lexical item: it is the student's job to let all these strategies interact to create a successful solution and reach his or her aim.

Summary

Vocabulary is the supporting structure of language: without words it would be impossible to communicate. Different linguistic experts have tried to define the term word but there have been several difficulties in finding a unique description for such a complex concept. This is why it is preferable to speak about lexical unit or lexeme.

A lexical unit is an abstract chunk that can modify its form depending on the linguistic context. Hence, a word is a group of letters that has a specific meaning and it carries at the same time more than one type of information: semantic, grammatical, morphological, phonological and orthographical information.

Memory and lexicon are strictly related because the vocabulary development depends on the one hand on the language input that the speaker hears and sees, and on the other hand on his or her memory.

Vocabulary development follows a different pattern in L1 and in L2 acquisition. L2 speakers have a rich language background that may influence positively or

negatively the language acquisition process. For example, L2 learners show a tendency to the equivalence strategy, namely, they compare the form of a L2 word to an already known L1 item. This strategy may lead them to transfer mistakes.

However, errors are not always a drawback of the language acquisition process. On the contrary, they show that the interlanguage, the temporary language system that the learner is developing, is working well.

Sometimes, there may be some problems in the interlanguage system. People with dyslexia experience difficulties in the phonological encoding process and for this reason they may articulate mispronounciations, circomlocutions or pauses creating a disrupted language output.

Some research focused their attention on the semantic memory, that is the long-term store responsible for lasting language acquisition. There are three different points of view about semantic memory: the network model, the set-theoretic model and the feature-comparison model.

It is clear that the organization of the lexicon in the human brain is not easy to describe because it does not resemble to a paper dictionary. Our brain works with associations that place the words by considering their phonological, orthographical and semantic characteristics.

In foreign language acquisition the teacher has to deal with several factors that may cause lexical disorders and in order to do that he or she has to use the appropriate strategies for the memorization of the new lexical items.

The first researcher who focused his attention on the importance of lexicon was Lewis, who developed the Lexical Approach. He described the language structure like a system of grammaticalized lexis.

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V

The vocabulary learning strategies

5.1 A definition of strategy

The word strategy comes from the Greek *stratēgia* that means generalship. *Stratēgia* was used to designate the movements of the army and the military plans to win a battle. Nowadays, it has a wider meaning and it is used to designate the organization of a plan to reach a goal (www.oxforddictionaries.com/definition/english/strategy).

It can be better described as the ability to plan appropriately a specific situation (www.dictionary.cambridge.org/dictionary/english/strategy).

In the educational field the word strategy refers to the skill of planning one's homework, which means the ability to study in a successful way to get positive results. The intellectually adept learner does not necessarily achieve the best results and may in fact be one of the lowest-performing students of the group due to his or her language-based learning difficulties, such as dyslexia (Deshler, Ellis & Lenz, 1996, Strichart & Mangrum, 1993, Wiig & Semel, 1990, cit. in Birsh, 2011).

Even if they appear similar in terms of academic ability, strategy and study skills are two different, yet important concepts. On the one hand, strategy refers to the approach to the task, that is, the way of thinking and acting when planning a task (Deshler et. al 1996, in Birsh, 2011). On the other hand, study skills are competencies that are indispensable for success at school and university. Hence,

study skills are abilities used to acquire, record, organize, synthesize, remember and use information (Devine, 1981, in Birsh, 2011).

5.2 Some models of language learning strategies

Strategies are "optimal methods for exploiting available information to increase the proficiency of L2 learning (…) and operate by bringing relevant knowledge to the language task that has the effect of improving performance" (Bialystock, 1978: 76, in Takač, 2008).

Bialystock observed that the human brain processes language in the same way as other types of information. She defined strategies as "optional mental activities" (Bialystock, 1978, in Takač, 2008: 32) and she made a distinction between formal and functional strategies.

Formal strategies are those strategies used to reach an accurate linguistic form through formal practicing and monitoring. It is a conscious process that aims at turning language knowledge into an automatic process.

Functional strategies include the communication endeavours of the L2 speaker, which means the language use.

The distinction between formal and functional strategies shows that formal practicing can create implicit knowledge, meaning that learning strategies may become an automatic process.

Apart from formal and functional strategies, Bialystock described another useful mechanism: the correction strategy. The human brain has the possibility to find mistakes in an utterance and to correct it in the output process.

Her model is made of three levels: input, knowledge and output and the use of one strategy instead of another depends on the individual characteristics of the student. Many factors may influence this choice:

1. The knowledge needed to solve the problem;
2. The difficulty of the task;
3. The language proficiency level.

Another point of view was offered by Clahsen et al. (1983). They created the *Multidimensional Model* that describe the L2 learning process as a path that may vary depending on the social-psychological orientation of the learner that can be either integrative or segregative.

The integrative learner uses different learning strategies and for this reason he is more likely to reach better results in L2. When integrative learners achieve high proficiency levels, they generally use an elaborative simplification strategy that involves hypotheses formulation about the L2 functioning.

On the contrary, segregative learners are more prone to restrictive simplification strategies, meaning they are likely to omit morphemes and other linguistic items.

A different model was proposed by Anderson (1983): the *Adaptive Control of Thought Model* (ACT). Anderson distinguished between declarative and procedural knowledge. The main difference lies in the fact that declarative knowledge, that is acquired suddenly, can be communicated with words, whilst procedural knowledge, that is acquired gradually, cannot be communicated verbally.

Anderson described L2 acquisition as a process made of three levels: cognitive, associative and autonomous states. Step by step and through practice, declarative

knowledge becomes proceduralised. Hence, the term acquisition is not a synonym of control over a kind of knowledge. A newly learned knowledge is declarative, whereas automatic recognition can be described as procedural. This means that the learning acquisition process starts with declarative ability and develops in proceduralised knowledge.

A model that lists the factors that can influence, in a positive way, the language learning process was depicted by Stern (1983).

The first important step is to organize an "*active planning strategy*" (Stern, 1983: 411). This means that the language learner plays a fundamental role in deciding actively the main goals of the learning process. Then, the student has to adopt an explicit learning strategy, that is, he or she has to analyze and monitor the interlanguage development by developing the appropriate techniques of practice. Third, a "*social learning strategy*" (Stern, 1983: 411) may favor the developing of L2. A good language learner tries to cope with the communication problems by using his or her interlanguage system, even if it is not perfect. Eventually, the foreign language learner needs effective strategies to deal with frustrations as well as the lack of self-esteem, in other words, a positive energy is a good tool to handle emotional problems.

5.3 Metamemory and visual imagination

Every student has to know his or her own strengths and weaknesses because every profile needs a different strategy to learn in the most appropriate way. A good student knows his mnemonic abilities and is able to handle them: this skill is

called *metamemory* (Cornoldi, Castanetto, 1988). Hence, the word metamemory refers to the knowledge about one's own memory and the ability to use it appropriately in the right context.

A strong metamemory allows the students to be aware of their imagination skills. The relationship between imagination and memory was first analyzed by Allan Paivio (1971), who observed that:

1. Verbal input (such as words, sentences or texts) that can be easily imagined is more likely to be remembered;
2. Memory skills improve if the students use mental images;
3. Good imaginators get better results than bad imaginators.

Moreover, the activation of both visual and verbal stimuli allows one to reach improved mnemonic skills. Paivio called it the theory of dual coding: the stimulus is better recalled if it can be imagined and described verbally.

There are two types of visual images that people can imagine: memory images and imaginative images. The former are real representations of items already seen in the past, the latter are just a product of imagination.

Apart from imagination, memory is fundamental in language acquisition. De Beni and Moé (2000) explained the relationship between acquisition and memory: to acquire means to understand and keep language knowledge in the mind for long time, and to be able to use it again in other contexts. In other words, acquisition is a long-lasting change of a student's cultural behavior caused by new experiences.

The first step to reach good results in the language acquisition process is to have great metacognitive abilities, that is, a deep knowledge of one's own cognitive functional ability. A well-organized metacognitive program should take into

account several characteristics: motivation, self-esteem and dedication (Cornoldi, De Beni, Gruppo MT, 1993, in De Beni, 2001). De Beni and Moè (2000) gave a clear description of what the ability to study is: it means to know the appropriate comprehension and memorization strategies and to use them in the correct activities, when necessary. Moreover, it is important to choose the right moments to study, to absorb the great amount of learning materials and to cope with anxiety in order to keep high motivation levels.

It is known that dyslexia may imply some difficulties in one or more of these areas and for this reason the acquisition process is harder. This happens because all the items of the acquisition process are strictly related and a gap in one knot may provoke the paralysis of the whole system.

Borokowski and Muthukrishna (1994) described metacognition as a model composed of several items that cooperate together. The experiences of the child are particularly important for the metacognitive development. If the child perceives that his or her learning strategies achieve good results, he or she will increase his or her self-esteem as well as motivation and will consider that specific strategy useful for further activities. In this way children learn which strategies are more effective and which are of less use.

5.3.1 Metacognitive awareness in reading comprehension

Flavel (1981), Jacobs and Paris (1987), and Brown, Ambuster and Baker (1986) developed some interesting metacognitive models that describe the working of the reading comprehension process.

First, the word metacognition refers to the knowledge that a person has about his or her own cognitive processes. It is an ability that allows a person to read a text and to understand it. Therefore, metacomprehension and metamemory are two areas that belong to the overall concept of metacognition.

At the start of the eighties, Flavel found three different areas that characterize metacognition: knowledge, experiences, and strategies.

Knowledge comprises both declarative knowledge and procedural knowledge, meaning the ability to know something and the skill to do something.

Metacognitive experiences depend on the person's knowledge. Experiences influence every step of the reading process because they allow one to organize and control the reading process, and, more precisely, to anticipate the quality of future reading results.

Eventually, the strategies that the student will use are strictly related to one's previous knowledge and experiences. The appropriate strategies allow the reader to focus on the aim of the text.

Jacobs and Paris distinguish between two main categories:

1. Knowledge self-assessment: it is the ability to realize if one's skills are appropriate to do a specific task. Declarative, procedural, and conditional knowledge belong to this area. For example, if the student knows that reading more than once the same text favors the memorization of its content, he or she will read it several times to be able to recall it later on. Procedural abilities are important to do something in practice, while conditional knowledge is fundamental to understand in which circumstances a specific strategy has to be used;

2. Executive functioning: it is the ability to control the application of a knowledge. Three subareas belong to this category: planning, assessment and monitoring. A skilled reader should not only be able to choose the appropriate strategies but he or she should assess the text comprehension process by using self-questioning or paraphrasing techniques or by summarizing the text. Eventually, an important skill of a fluent reader is the monitor ability: during the reading process there could be the necessity to change strategies because the characteristics of the text may change. For this reason the reader has to stay focused on the flexible aims of the text.

Brown's (1986) model focuses on four aspects that influence the reading comprehension process:

1. The type of the text: the structure may determine the clearness of the text and its difficulty.
2. The task: the aim of each text makes every text different. There are on the one hand educational texts, on the other hand entertainment texts;
3. The strategies: every strategy has a different effect on the reading process and for each reading passage the student should use a different strategy. First, it is important to be able to use skimming and scanning strategies. Skimming refers to the global understanding ability, scanning is the opposite, that is the understanding of specific pieces of information. In some cases a selective strategy is required, which means the ability to look for some isolated items in the text. Most of all, fix-up strategies are useful

to keep high comprehension levels through rereading, note taking and underlining;

4. Individual characteristics: the awareness of one's strengths and weaknesses is fundamental to approach the text appropriately.

Moreover, this model takes into account also another factor: the sensitivity to the text. This expression refers to several skills, such as the ability:

1. to face the grammatical, syntactical and semantic difficulties;
2. to distinguish between relevant and unimportant elements;
3. to identify inconsistencies or mistakes.

Particularly, Brown, Ambuster and Baker (1986) observed that students with learning disabilities experience some difficulties in the structure analysis, and when there are mistakes or abnormalities in the text. Furthermore, they do not differentiate between important and minor types of information in a text.

5.3.2 Metacognitive awareness in the writing process

Metacognition was further analyzed by Bracewell (1983, cit. in De Beni 2001). He introduced the difference between metacognitive knowledge and executive control. Metacognitive knowledge is the awareness that every writer has about his or her own cognitive abilities, and the skill to handle:

1. The characteristics of the task;
2. The rules of the written text;
3. The intervention strategies appropriate to write a specific kind of text.

The expression executive control refers to those strategies that a writer uses to:

1. Decide the type of content;
2. Chose and organize the ideas;
3. Give the appropriate harmony to the different parts of the text.

A writer with strong metacognitive abilities has a deep awareness of the relationship between the written text and its underlying meaning.

Brown (1987, cit. in De Beni, 2001) identified three main factors that are fundamental in the cognitive processes involved in writing activities: prediction of the difficulties, planning of the structure, monitoring of the problems, and assessment of the strategies used to write the text.

5.3.3 Dyslexia-friendly strategies

It is important to focus on the role of vocabulary learning strategies since childhood because strong language skills in L1 facilitate future reading abilities in a foreign language (Slavin & Cheung, 2003, in Graves 2006). Students with a smaller vocabulary are more likely to be linguistically disadvantaged, whilst students with a rich vocabulary are more successful. For this reason, it is a good idea to intervene with the appropriate intervention strategies at pre-school and primary-grade years. Some educators (Becker, 1977, Biemiller, 2001, Chall, Jacobs, & Baldwin, 1990, Hart & Risley, 2003 in Graves, 2006) proposed the "*interactive oral reading"* (Graves, 2006:18) as a strategy to help children to read a text: adults read the text to children and they periodically stop the reading to focus on some words or other aspects of the text. This strategy helps the little children to think critically about the text.

Many reports and studies have demonstrated that high literacy rates are indispensable in high school, and especially at university (Birsh, 2011). To reach effective study skills in adulthood is not an easy task: it takes time to gain success because the cooperation between teacher and student is required (Deshler et al 1996, in Birsh, 2011). On the one hand the priorities and the goals of the student have to be taken into account, on the other hand the teacher has to create the appropriate teaching program, by cooperating with an instructor, which means a mentor that teaches the dyslexic student the most successful skills (Birsh, 2011).

This type of organization takes some time, but it does not have to become too enduring because students with dyslexia have to experience positive change quickly, not long after having started the study skills course (Birsh, 2011).

In 1970 at the *TRI-Services Center for Children and Adults with Learning Disabilities* (Rockville, Maryland) a new study skill approach was developed: the SkORE strategy. It focuses on the improvement of several areas, such as planning, concentration, self-monitoring, self-correcting, memory, recognition of saliency and interactive learning (Birsh, 2011).

The first area to organize is space: the home study area has to be furnished with the necessary books, teaching materials and web references. Even if the teacher, especially the university lecturer, cannot monitor the student's study organization he or she can give some suggestions about the home study area.

Every university student, and most of all the dyslexic university students, has to know which books, websites to use while he or she is studying. An equipped student will need a good collegiate dictionary, a thesaurus, an etymological dictionary, a handbook that contains the essential idioms, a dictionary of historical

and literacy allusions, a grammar book, a handbook on the English language usage and a general reference book. Other items, such as atlas or books of historical time lines may also be useful (Birsh, 2011).

The second important area to control is time management. The university student could fill out a set of daily, weekly and monthly calendars to make a note of all the important events, such as lessons, exams, seminars and so on (Birsh, 2011).

5.4 The teaching of word-learning strategies

There are several word-learning strategies that can be used during the lecture. To be an adult and a university student does not necessarily mean to be able to use the appropriate tools in the best way. Dyslexic students may experience gaps in their education that have not been filled in the course of their past school years.

Some gaps may be found in the word learning strategies they use to read a text in a foreign language. For example, three fields that should be strongly developed in order to reach good results in the word-learning process are the use of context, word parts and dictionary.

Context clues are useful tools, especially for adult proficient readers. They can easily deduce the meaning of an unknown word of a text. This task is easier if the text contains a limited number of unknown words (Swanborn & de Glopper, 1999, in Graves, 2006).

It is true that the chances to learn a new word from a single occurrence is very low but it is also probable that this opportunity increases with more than one occurrence of the same word (Graves, 2006).

Word parts analysis includes the study of Latin and Greek roots, inflections, derivational suffixes, and prefixes. These elements may help the student to see the inner structure of the word.

Another difficult task is the use of the dictionary. It is not rare that learners misunderstand definitions because they select only a little fragment of the whole definition of the lexeme or that they strictly parallel the sample sentence presented in the lexical item entry (Miller & Gildea, 1987, in Graves, 2006). Using the dictionary is particularly difficult for elementary children, it is not easy for college students and it is not totally successful for university students, especially if they suffer from a learning disorder. Hence, traditional dictionaries need to be changed and improved to favor the lexical access to everybody (Graves, 2006).

Apart from these tools, there are other types of procedures that can be used to improve the writing of vocabulary, namely spelling skills (Birsh, 2011):

1. Copying on wide-ruled paper: the teacher writes on the bottom of a blank page a word, and the student copies the same word below the model. The letters have to be perfectly aligned under those above. Finger-proofing and saying the name of each letter aloud may help the student to remember it while copying. 7-10 copies should be enough to recall the spelling of the word. If not, other techniques can be tried;
2. Cloze technique: for each letter of the word that the student has to learn the teacher makes an underline. First the word is presented with one letter missing, that is with an underline, than the teacher hides the second letter and so on. Step by step the student has to fill in the missing letter(s), like table 1 shows.

Tab. 1 - Cloze technique to improve spelling skills (Birsh, 2011)

taught	The first input is represented by the complete word
_ aught	Then, remove the easiest letter
_ augh _	Omit the second easiest letter
_ au_ _ _	Remove the more difficult digraph *gh*
_ _ _ _ _	Eventually, eliminate the digraph *au*

3. Tracing: this technique is particularly useful for dyslexic students to learn irregularly spelled words (for example *rough*). The materials needed are a felt-tip pen and double-fold industrial strength paper towels. No more than five words per session should be administered. First of all, the student has to open the paper towel at the top. Then, the instructor writes the model of the word on the upper front panel. The letters should be written with clear and large style. The student has to use both index and middle finger to trace each letter and say each phoneme as the fingers trace over the letters. This must be repeated three times. Then the student writes the words on the center panel. If he or she does no mistakes the word is written again and compared with the model. This procedure has to be repeated for three days, once a week for three weeks and for the next three months once a month.
4. Syllable spelling: spelling skills can be improved by focusing on the teachers's lips, listening to his or her words, echoing the words, tapping out them while saying the syllables, and writing it down;
5. Spelling by geometric progression: the teacher can write the root of the new word on a blank page more than one time creating a column. Then,

line by line the word can be modified with prefixes or suffixes showing how the meaning changes with every form. The words could be organized in groups putting on the left words with Anglo – Saxon origin, on the right words that come from Latin (table 2).

Tab. 2 – Spelling by geometric progression (Birsh, 2011)

Anglo-Saxon			Latin
stand	**sew**	**friend**	**human**
stand s	**sew** s	**friend** s	**human** ness
stand ing	**sew** ed	**friend** ly	in **human** ness
un der **stand** ing	**sew** ing	**friend** ship	in **human** ity
un der **stand** ing s	**sew** er	be **friend**	**human** ize
mis un der **stand** ing	**sew** n	be **friend** ed	**human** iz ed
up **stand** ing	un **sew** n		**human** iz ing
out **stand** ing			

Summary

The key of academic success is the skill to plan one's homework in the appropriate way: this ability is called strategy. Strategy and study skills represent the two most important elements to increase the proficiency of the second language acquisition.

Several researchers have focused their attention to the L2 learning strategies: Bialystock, Clahsen et al., and Anderson described how linguistic input turns into proceduralised knowledge.

In this process, the dyslexic adult plays a fundamental role because he or she is the main character of the lecture: the student has to adopt an explicit learning

strategy, analyse and monitor the interlanguage development, and develop the appropriate techniques of practice.

The first step consists in improving one's metamemory, which means knowing one's mnemonic abilities and to be able to handle them. The relationship between metamemory and acquisition can be explained in the following way: to know one's weaknesses and strengths allows organizing a good study program. On the contrary, low metacognitive abilities provoke some difficulties in several areas of the acquisition process.

The first important element that contributes to the improvement of one's metacognitive abilities is knowledge: the ability to know something favours new experiences and new experiences enhance the use of appropriate learning strategies.

These skills are particularly useful to have a clear comprehension of a text, because a skilled student knows how to approach a reading comprehension activity.

In those cases in which students experience learning difficulties, vocabulary learning strategies may be a good solution to improve the dyslexic's reading abilities: it is the teacher's role to mentor the dyslexic student with the best tools and strategies.

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I

Analysis and discussion

1.1 Introduction

The aim of this study is to analyze the experiences of some university students with dyslexia. The data collected from the questionnaire gives a description of the students' points of view and allows us to find an answer to the research questions of this study:

1) Which are the most used vocabulary learning strategies by the dyslexic students?
2) Is there a relation between the students' past school experiences, the choice of the appropriate strategies and their academic results?
3) Which learning strategies can be linked to positive academic results?

1.2 The hypothesis

Several studies were conducted on the most used vocabulary learning strategies in the foreign language acquisition process.

Shanaoui (1995) studied the mnemonic procedures that mature age L2 learners use to approach the task of words acquisition. The participants of this survey came from different linguistic backgrounds (the group was made of French, Spanish, Japanese, Chinese and Arabic students) that studied English as a second

language. From the results of this study emerged that the learners behave in different ways as regards their relation with independent study, lexical items recording and vocabulary reviewing outside the academic language course.

Lawson and Hogben (1996) focused their attention on a different type of sample. They observed the strategies adopted by Australian university students that learned Italian as a foreign language who preferred repetition strategies instead of word structure techniques, such as the analysis of the parts of the word.

In the Eastern languages context, Lip (2009) observed some Chinese adult learners. He pointed out that the learners preferred either to repeat the word in the mind more times or to analyze its structure by breaking it down into segments in order to retain it in memory.

Hence, it is clear that some strategies are more common than others. Considering that this pattern can be observed in students with no learning disabilities, it seems likely that also Italian dyslexic students show a preference for some strategies and not for others.

Moreover, other pieces of research (Ghadessy, 1998) focused on the influence of the field of study to see if it affects the learning strategies usage. He analyzed how gender, proficiency in L1 and L2, and field of study may influence the choice of the vocabulary learning strategies.

This work too, deals with some variants, such as the areas of study and the personal experiences, such as age of diagnosis and abroad experiences, to understand to which extent they can affect the choice of the strategies and, as a consequence, the academic results.

1.3 The questionnaire

The questionnaire is adapted from Lip (2009) and Ghadessy (1998).

Lip divided his survey in two parts: a questionnaire and a final interview. In the first section several kinds of strategies were investigated, such as cognitive, memory, determination, and social strategies. Cognitive strategies involve, for example, the repetition of the new word. Memory strategies consist in associating the new word to a known element, while determination strategies lie in analyzing the parts of the lexical item. Lastly, social strategies are those that involve the relationship with other people, for example teachers or classmates.

The final interview was made of four open questions that aimed at examining the reasons why they consider the previous mentioned strategies as either useful/useless.

Ghadessy divided the research in two parts as well. Section one dealt with some personal information related to the students' past academic experience, whereas section two was made of 5-point scale questions regarding memorization strategies used to learn new lexemes.

Hence, from the adaptation of the above-mentioned surveys comes this questionnaire of 59 questions, both open and closed-ended. It comprises 4 parts that aim at analyzing:

1. Personal information data;
2. Information about past school experiences;
3. Personal considerations about one's own mnemonic abilities;
4. Memorization strategies used to learn.

In the first part, age, nationality and gender are required.

Then, there are sixteen questions about the choice of the academic course, their favorite subject and their relationship with foreign language acquisition and/or abroad experiences (this part was partly inspired by Ghadessy's first section). Moreover, they are asked to answer to some questions that deal with dyslexia, such as the identification of their learning disability.

In the final and fourth section, there are questions about useful and useless memorization strategies that the students use to learn the vocabulary of a foreign language. More precisely, the last few questions focus on phonics and its role in the vocabulary learning process. Furthermore, the students are asked to give their point of view about the results they have reached in the L2 acquisition. This part draws inspiration from Lip's (2009) survey and the way he organized the different types of memorization strategies.

The results of this questionnaire are presented in tables and bar charts that display the percentages and frequencies (the percentages have sometimes been rounded-off).

1.4 The population

The participants were recruited from several Italian universities, thanks to the help of the offices of disability services of some universities and the AID association that volunteered to spread the questionnaire among the groups of their dyslexic students by sending a Google Form link to them.

The population that participated in this survey is composed of 22 Italian dyslexic adults, ranging in age from 19 to 40 (mean age 23,8). Between them, four are males and eighteen are females[1].

They were divided into subgroups by taking into account their academic course. The students belong to different areas, namely, they attend academic courses such as Western languages, Eastern languages, arts, history, cultural heritage, education, psychology, economy, law, geology and osteopathy. Three main areas were identified, considering the similarities of the plan of studies: linguistic, classical, and economics-scientific area.

To the first group (labeled as Lang.) belong six foreign language students, both Western languages and Eastern languages students. 83% of this area is made of females. Furthermore, the students of this sector have a higher mean age (25,5).

The human studies area (shortened as Hum.), made of seven participants, comprises syllabuses that belong to the liberal arts sector, such as history, education and arts, that is, all those disciplines that deal with the human culture. Within this group, 57% are women and the mean age is somewhat lower (22,5).

The last area (labeled Scien.) comprises nine students and spreads from strictly scientific academic courses, such as osteopathy and geology, to economics, law and some liberal arts courses whose plans of studies are characterized by a significant number of science subjects such as statistics, chemistry and/or

[1] The sample is not representative. For this reason it is not possible to investigate the difference between genders.

[2] The syllabus of the cultural heritage course comprises several chemistry subjects, whereas those who study psychology deal with biology and anatomy. Moreover, in other courses, such as EGArt and law, there are

biology[2]. The scientific area is totally made of female participants whose mean age is 23,7.

1.4.1 The participants and their relationship with foreign languages

Even if they attend different academic courses, they all study the English language because it is a compulsory subject in the Italian university system. Moreover, 77% of students have studied or are still studying a third (or even fourth) foreign language, as shown in table 1.

Tab. 1 – The foreign languages studied by the participants

	English		**French**		**Spanish**		**German**		**Russian**		**LIS**		**Japanese**		**Chinese**		**Korean**	
Ling.	6/6	100%	3/6	50%	2/6	33%	1/6	17%	2/6	33%	1/6	17%	2/6	33%	1/6	17%	1/6	17%
Hum.	7/7	100%	3/7	43%	1/7	14%	1/7	14%	0/7	0%	0/7	0%	0/7	0%	0/7	0%	0/7	0%
Scien.	9/9	100%	4/9	44%	1/9	11%	3/9	33%	0/9	0%	0/9	0%	0/9	0%	0/9	0%	0/9	0%
Total	**22/22**	**100%**	**10/22**	**45%**	**4/22**	**18%**	**5/22**	**23%**	**2/22**	**9%**	**1/22**	**4%**	**2/22**	**9%**	**1/22**	**4%**	**1/22**	**4%**

All the foreign language students have studied more than one L2, whereas those belonging to the classical or the scientific group are less polyglot.

The relationship with foreign language acquisition is different in the three groups: on the one hand, all the foreign language students like studying an L2, on the other hand, a high percentage of the scientific area dislikes foreign languages. The majority of liberal arts students neither likes nor dislikes L2 acquisition.

Hence, just 18% of all participants define a foreign language as their favourite subject and it is not a case that those that have a good relationship with L2

[2] The syllabus of the cultural heritage course comprises several chemistry subjects, whereas those who study psychology deal with biology and anatomy. Moreover, in other courses, such as EGArt and law, there are also subjects like statistics and economics.

learning are enrolled in a foreign language academic course. This fact does not mean that all those who attend a foreign language course appreciate just foreign languages: 33% of the foreign language group prefer history instead of an L2. An exception is represented by one student of the scientific group that claims to love foreign languages, instead of the main subject of her academic course. 57% of the human studies participants prefer history (such as general history, contemporary history or art history) and the rest part the main subject of the academic course, except for one student that has no favourite subject at all. Also the scientific area prefers to study the main subjects of the academic course.

The students were asked to explain the reasons why they like a foreign language and their answers mirror, in some cases, their talents. As regards to foreign language students, the majority aim at learning a new language because they have an intercultural attitude and they love to communicate with cultures that differ from the Italian one. This group can be discriminated from the other groups because it is the only one that highlights the love for a foreign country. The other areas focus on other elements: within liberal arts group, 28% of students like learning an L2 because they want to widen their communicative skills in order to understand people from different cultures. Moreover, one out of seven wants to travel a lot and another likes to learn new sounds and new expressions of a different language.

On the contrary, the scientific sector is just attracted by the communicative side of languages (22%): the better a person knows foreign languages, the easier it is to understand other people. Interestingly, one participant focused her attention on the relationship between memory and foreign language acquisition: she believes

that to learn a foreign language means to train one's memory and to find new learning strategies that can be helpful to face dyslexia.

The students of the human studies area that neither like nor dislike foreign languages claim that the pleasure of studying a foreign language depends on several factors, such as the orthography of the language, the type of code (some students prefer the written code) and the way the teacher pronounces the sounds of the language. They believe that it is better to have a mother tongue teacher because his or her pronunciation has a stronger effect on the student's auditory retention. Another student of the scientific area that neither likes nor dislikes foreign languages claims that her difficulties are related to her learning disability and to the inability of the foreign language teachers that teach to dyslexic students.

The participants that do not like foreign languages put the blame on dyslexia and they consider themselves unable to understand an L2. Furthermore, they find foreign language acquisition too stressful. The small amount of participants that do not like foreign languages are not able to find a specific reason for it.

However, regardless of the attitude they have towards foreign languages, everybody considers foreign language knowledge useful.

There are several reasons why they all define a foreign language useful. They think that knowing more than one language provides the possibility to:

1. Travel abroad and experience a different culture: good language skills allow one to spend one's holidays in another country. It is a useful tool to spend a semester abroad and improve one's intercultural skills. Furthermore, it enriches one's background culture;

2. Communicate with people from different countries and cultures: being able to understand what another says is the key to intercultural success. By improving one's communication skills, people are more likely to find a job;
3. Find a better job: a lot of scientific papers and official documents are written in English. Being able to speak and write in L2 provides the chance for promotion;
4. Increase brain activity: the more languages one knows, the more active is the brain activity. Furthermore, good brain activity allows one to adjust quickly to a new intercultural environment.

Almost all the students have studied in Italy, as shown in table 2.

Tab. 2 – The localities where the students have studied

Groups	In Italy		Both in Italy and abroad		Abroad	
Lang.	4/6	67%	2/6	33%	0/6	0%
Hum.	6/6	100%	0/7	0%	0/7	0%
Scien.	8/9	89%	1/9	11%	0/9	0%
Total	**18/22**	**82%**	**3/22**	**14%**	**0/22**	**0%**

Some participants have spent some years abroad and other years in Italy. In the foreign language group there is a relatively high percentage of students who have spent some years abroad, whereas in the human studies area, everybody studied in Italy. In the scientific sector just one out of nine students went abroad.

Apart from that, one foreign language student and one of the scientific area students, studied both in Italy and abroad for some years as well as participating in an exchange program. They claim that an experience abroad has been helpful to improve their L2 knowledge. A positive judgement comes also from those

students that have either spent some school years abroad or that have participated in an exchange program. Only one liberal arts student expressed a negative point of view: that is, being an exchange student has not been useful.

Those who are satisfied about their abroad experience claim to have improved in several sectors. The main areas in which they have seen significant signs of improvement can be grouped in the following way:

1. Fluency: an experience abroad allows to improve fast-speech, an ability that cannot be trained at school;
2. Vocabulary: a total immersion in the foreign language widens vocabulary skills;
3. Pronunciation: there is a strong relation between phonics and lexicon. The better the pronunciation is, the easier it is to memorize new words;
4. Comprehension and intercultural communication: better comprehension skills favour better communication abilities and open the mind towards intercultural situations;
5. Academic success: a general improvement allows attainment of better results at university with less effort.

There are some differences between the three study areas: whereas the foreign language students claim to have improved most of all pronunciation, vocabulary and intercultural skills, the liberal arts participants have reached good results in communication skills. They have trained phonology and fluency and have reached better academic results thanks to these abilities. The scientific area too, considers fluency and pronunciation the most trained areas. Furthermore, these

skills have contributed to the improving of communicative abilities and to the growth of the L2 vocabulary.

1.4.2 The participants and their relation with their learning disability

All the participants have received a diagnosis of learning disabilities, but not everybody at the same age. Table 3 shows the age ranges when the three groups received the diagnosis of dyslexia:

Tab. 3 – The age ranges when the students found out to be dyslexic

	From 6 to 10		**From 10 to 14**		**From 14 to 18**		**From 18 to 35**		**Mean age**
Lang.	4/6	67%	0/6	0%	0/6	0%	2/6	33%	**14**
Hum.	3/7	43%	2/7	29%	2/7	29%	0/7	0%	**11**
Scien.	0/9	0%	0/9	0%	7/9	78%	2/9	22%	**19**
Total	**7/22**	**32%**	**2/22**	**9%**	**9/22**	**41%**	**4/22**	**18%**	**15**

Whereas the majority of foreign language and liberal arts students were found to be dyslexic in childhood, in the scientific group the majority of participants were diagnosed between adolescence and adulthood. In the human studies area a significant percentage were discovered to be dyslexic between 10 and 18 years. Hence, the mean age of diagnosis is higher in the last group, whereas the human studies area has the lower age of diagnosis because nobody was diagnosed in adulthood.

For the participants, the late diagnosis is not related to a late onset of the learning disability: before receiving the appropriate support for their learning disability, almost everybody experienced many difficulties. The same pattern can be observed in all the three subgroups, even the students of the scientific area have a

relatively high percentage of students who experienced problems, as outlined in table 4.

Tab. 4 - The quantity of students who experienced more difficulties than their fellows.
Answers to the question "15. Do you think that you have experienced more difficulties than your fellows in L2 acquisition?

Groups	Yes		No	
Lang.	5/6	83%	1/6	17%
Hum.	6/7	86%	1/7	14%
Scien.	9/9	100%	0/9	0%
Total	**20/22**	**91%**	**2/22**	**9%**

The students were also asked about the origin of their difficulties and their answers encompass several difficulties.

The most widespread problem involves memory: a lot of participants highlight that they are not able to remember grammar rules and vocabulary. This issue concerns more or less all the study areas.

Two participants of the foreign languages area also blamed dyslexia: they consider their difficulties as the direct consequence of their learning disability and they can explain no further reason why they are not able to memorize new vocabulary.

The members of the liberal arts area complain about the university system organization: there are too many teachers that are not able to manage dyslexia and they do not allow the dyslexic students more time. Furthermore, their problems are also related to the inherent properties of the English orthography that has been described as opaque by a significant number of participants.

Apart from the above-mentioned difficulties, some students of the scientific area also complain about the lack of compensatory and dispensatory measures.

As regards the most difficult tasks in foreign language acquisition, a different pattern can be observed in the three groups, like shown in table 5.

Tab. 5 – The most difficult tasks in foreign language acquisition.
Answers to the question "17. In which areas did you experience more difficulties?"

Groups	Reading		Listening		Writing		Speaking	
Lang.	3/6	50%	0/6	0%	1/6	17%	1/6	17%
Hum.	2/7	29%	0/7	0%	4/7	57%	1/7	14%
Scien.	2/9	22%	2/9	22%	4/9	44%	1/9	11%
Total	**5/22**	**23%**	**2/22**	**9%**	**9/22**	**41%**	**3/22**	**14%**

Not all the tasks are equally hard for the participants: for the majority of foreign language students reading tasks are the most difficult exercises. One student claims to have some problems with writing activities and another with speaking tasks.

The majority of the other two areas experience more difficulties, most of all with writing tasks but a small percentage claim to have problems with reading activities. In both areas speaking tasks are considered also difficult by one student.

1.4.3 The participants and their relation with memory

As emerges from the questionnaire, the majority of students do not like those tasks that involve the use of memory.

The part of the linguistic area that likes this kind of activities claims that they are useful because they give the opportunity not to build a discourse of one's own: a

memorized text doesn't need to be changed and it is ready to use, namely, with a prearranged form it is not necessary to pull a discourse out of the air.

The part that does not like to learn by heart, either dislikes certain types of text, such as poetry, or is not able to explain the reason why they dislike memorization activities.

The humanistic area highlights the importance of the type of the text in the learning process. One student prefers learning, by heart, just songs or brief sentences and another one considers memorization activities particularly useful to learn a foreign language.

Those students that do not like these tasks describe themselves as "stupid" or they put the blame on the difficulty of the task.

The scientific group focuses on the importance of vocabulary learning: texts learned from memory are considered a precious tool to acquire new words. Moreover, one student of this group considers the type of the text also extremely important: the memorization of scripts can be a pleasurable activity if, for example, the student likes theatre.

One of those who dislike memory activities considers them useless: she believes that if there is the opportunity to print the text and carry it everywhere, then there is no point in memorizing it.

Even if not everybody considers memory important, a general trend can be observed in the memorization process: one of the most easily remembered elements of a text is the general meaning.

Tab. 6 – The parts of the text that the students tend to remember more easily.
Answers to the question "22. What do you remember more easily of a new text?"

Groups	The beginning		The end		Key words		The general meaning		Some unrelated parts	
Lang.	1/6	17%	0/6	0%	2/6	33%	2/6	33%	1/6	17%
Hum.	1/7	14%	0/7	0%	1/7	14%	3/7	43%	2/7	29%
Scien.	2/9	22%	0/9	0%	1/9	11%	5/9	56%	1/9	11%
Total	**4/22**	**18%**	**0/22**	**0%**	**4/22**	**18%**	**10/22**	**45%**	**4/22**	**18%**

However, there is a small difference between the foreign language group and the other two groups: whereas the former has the same quantity of students who are likely to remember either the key words of a text or the general meaning, the other two groups have a higher percentage of participants that retain the general meaning. In all the groups there is a small percentage of students who remember the beginning or some unrelated parts of it and nobody tends to remember the end of a text.

In order to understand the main content of a text, lexical skills are fundamental: the majority of all the groups consider vocabulary knowledge fundamental in foreign language acquisition. Refer to table 7.

Tab. 7 – The parts of the text considered important to improve one's L2 skills.
Answers to the question "23. What do you have to memorize to improve your L2 skills?"

	Vocabulary		Grammar		Sentences		Idiomatic expressions		Dialogues		Other	
Lang.	4/6	67%	0/6	0%	0/6	0%	2/6	33%	0/6	0%	0/6	0%
Hum.	3/7	43%	1/7	14%	1/7	14%	0/7	0%	1/7	14%	1/7	14%
Scien.	5/9	56%	2/9	22%	1/9	11%	1/9	11%	1/9	11%	0/9	0%
Total	**12/22**	**55%**	**3/22**	**14%**	**2/22**	**9%**	**3/22**	**14%**	**2/22**	**9%**	**1/22**	**4%**

Another linguistic element that is strictly related to vocabulary, idiomatic expressions, is particularly important for the foreign language students. In order to understand the meaning of an idiomatic expression it is important to first know

all of the words that make it up and above all, the meaning of the whole expression that cannot always be inferred from the meanings of all the words of the expression.

Grammar, sentences and dialogues play a secondary role, however a small percentage of the human studies area as well as the scientific sector, consider them important.

1.4.4 The use of memorization strategies

The vast majority of participants consider memorization strategies very useful to widen one's lexicon but not all the learning strategies are evaluated in the same way: some are considered more advantageous, others more disadvantageous. Just a small percentage of the human studies area and of the scientific sector expressed some doubts about the usefulness of valuable learning strategies.

Before investigating the memorization strategies that participants use to learn, some data about their experiences with memory and motivation were collected.

The students were asked if they need a lot of time to memorize new words and a high percentage of students answered positively. The two areas that need more time are the foreign language and the scientific area, whereas the majority of the liberal arts students hold a neutral position: they need neither too much time nor too little.

With regards to their relation with motivation, almost everybody considers it a significant element in foreign language acquisition: on the one hand the human studies area totally agrees with the usefulness of motivation in the learning

process, on the other hand in the scientific sector, there are some students that do not consider it really important. Foreign language students also put high value on motivation, however whereas 67% of them consider motivation absolutely important, 33% define it as just useful.

Table 8 illustrates the answers regarding the relationship of the students with their mnemonic skills and motivation.

Tab. 8 - The relationship of the students with their mnemonic skills and motivation.
Answers to the questions "24. Do you need a lot of time to memorize new lexical items?", "25. Is motivation important to remember what you study?", "26. Are memorization strategies important to learn a foreign language?"

		Definitely not		No		So so		Yes		Yes, definitely	
Questions	**Groups**	**1**		**2**		**3**		**4**		**5**	
24.	**Lang.**	0/6	0%	0/6	0%	0/6	0%	4/6	67%	2/6	33%
	Hum.	0/7	0%	0/7	0%	4/7	57%	1/7	14%	2/7	29%
	Scien.	0/9	0%	1/9	11%	1/9	11%	4/9	44%	3/9	33%
	Total	**0/22**	**0%**	**1/22**	**4%**	**5/22**	**23%**	**9/22**	**41%**	**7/22**	**32%**
25.	**Lang.**	0/6	0%	0/6	0%	0/6	0%	2/6	33%	4/6	67%
	Hum.	0/7	0%	0/7	0%	0/7	0%	0/7	0%	7/7	100%
	Scien.	0/9	0%	1/9	11%	2/9	22%	3/9	33%	3/9	33%
	Total	**0/22**	**0%**	**1/22**	**4%**	**2/22**	**9%**	**5/22**	**23%**	**14/22**	**64%**
26.	**Lang.**	0/6	0%	0/6	0%	0/6	0%	1/6	17%	5/6	83%
	Hum.	0/7	0%	0/7	0%	1/7	14%	0/7	0%	6/7	86%
	Scien.	0/9	0%	0/9	0%	1/9	11%	2/9	22%	6/9	67%
	Total	**0/22**	**0%**	**0/22**	**0%**	**2/22**	**9%**	**3/22**	**14%**	**17/22**	**77%**

1.5 An analysis of the most widespread strategies

As already stated, not all the learning strategies are considered highly useful: the three groups show different patterns in relation to each strategy investigated throughout the questionnaire.

Several areas were examined, such as their passion for music, TV programs and videogames. They were also asked about the use of dictionaries and the type of

dictionary they prefer. Some questions deal with their reading habits. Moreover, data about their relation with their teachers or their fellow-students were collected. Other questions refer to repetition or association activities, while others focus on word-structure analysis. To conclude, the questionnaire also aims at obtaining information about the students' visual skills, phonetic transcription abilities or more traditional learning strategies, such as listing activities.

1.5.1 Music, TV programs and videogames

With respect to music, it seems to be a highly appreciated learning tool by a lot of students and has been estabilished as the third most widespread tool.

Whereas foreign language students prefer singing a song in L2 by reading its text, the human studies area and the scientific group would prefer to listen to a song passively.

Generally speaking, singing by remembering the text, represents the less used strategy, and this applies especially to the scientific sector, where three students out of nine claimed that they never learnt the words of a song by heart.

Tab. 9 – The relation of the students with music.
Answers to the statements "27. I listen to songs in L2", "28. I sing a song in L2 by reading its text", "29. I sing by remembering the text from memory"

		Never		Rarely		Sometimes		Often		Always	
Statement	**Groups**	**1**		**2**		**3**		**4**		**5**	
27.	**Lang.**	0/6	0%	1/6	17%	1/6	17%	1/6	17%	3/6	50%
	Hum.	0/7	0%	2/7	29%	2/7	29%	2/7	29%	1/7	14%
	Scien.	0/9	0%	2/9	22%	2/9	22%	3/9	33%	2/9	22%
	Total	**0/22**	**0%**	**5/22**	**23%**	**5/22**	**23%**	**6/22**	**27%**	**6/22**	**27%**
28.	**Lang.**	0/6	0%	0/6	0%	2/6	33%	0/6	0%	4/6	67%
	Hum.	4/7	57%	1/7	14%	0/7	0%	1/7	14%	1/7	14%
	Scien.	1/9	11%	3/7	43%	2/7	29%	2/9	22%	1/9	11%
	Total	**5/22**	**23%**	**4/22**	**18%**	**4/22**	**18%**	**3/22**	**14%**	**6/22**	**27%**
29.	**Lang.**	0/6	0%	1/6	17%	0/6	0%	2/6	33%	2/6	33%
	Hum.	3/7	43%	0/7	0%	2/7	29%	2/7	29%	0/7	0%
	Scien.	3/9	33%	0/9	0%	2/9	22%	4/9	44%	0/9	0%
	Total	**6/22**	**27%**	**1/22**	**4%**	**4/22**	**18%**	**6/22**	**27%**	**2/22**	**9%**

Watching TV programs is not an equally widespread strategy. On the one hand foreign language and liberal arts students watch a lot of television in L2. On the other hand, the scientific group are not really utilising TV programs to a great extent. The majority of this group almost never look at TV programs without subtitles. In fact, a significant portion of this group do not like TV programs even if they have subtitles.

An interesting result concerns the preference of the linguistic area for programs without subtitles, where the other two groups actually do prefer subtitled movies.

Tab. 10 - The relation of the students with TV programs in L2.
Answers to the statements "30. I watch TV programs in L2 with subtitles", "31. I watch TV programs in L2 without subtitles"

		Never		Rarely		Sometimes		Often		Always	
Statement	**Groups**	**1**		**2**		**3**		**4**		**5**	
30.	**Lang.**	2/6	33%	1/6	17%	1/6	17%	0/6	0%	2/6	33%
	Hum.	1/7	14%	1/7	14%	3/7	43%	1/7	14%	1/7	14%
	Scien.	4/9	44%	0/9	0%	2/9	22%	2/9	22%	1/9	11%
	Total	**7/22**	**32%**	**2/22**	**9%**	**6/22**	**27%**	**2/22**	**9%**	**4/22**	**18%**
31.	**Lang.**	0/6	0%	0/6	0%	1/6	17%	0/6	0%	5/6	83%
	Hum.	2/7	29%	2/7	29%	2/7	29%	1/7	14%	0/7	0%
	Scien.	8/9	89%	1/9	11%	0/9	0%	0/9	0%	0/9	0%
	Total	**10/22**	**45%**	**3/22**	**14%**	**3/22**	**14%**	**1/22**	**4%**	**5/22**	**23%**

With regard to other technological tools, foreign language students are more prone to set up the L2 in the internet browser or in the videogames they use, whereas the majority of the other two groups do not seem to appreciate these learning strategies, as table 11 shows.

Tab. 11 – The quantity of students who set up the foreign language to surf the net or to play a videogame.
Answers to the statements "32. I set up the L2 in my Internet Browser", "33. I set up my videogames in L2".

		Never		Rarely		Sometimes		Often		Always	
Statement	**Groups**	**1**		**2**		**3**		**4**		**5**	
32.	**Lang.**	3/6	50%	0/6	0%	0/6	0%	0/6	0%	3/6	50%
	Hum.	4/7	57%	0/7	0%	2/7	29%	0/7	0%	1/7	14%
	Scien.	6/9	67%	3/9	33%	0/9	0%	0/9	0%	0/9	0%
	Total	**13/22**	**59%**	**3/22**	**14%**	**2/22**	**9%**	**0/22**	**0%**	**4/22**	**18%**
33.	**Lang.**	3/6	50%	0/6	0%	1/6	17%	0/6	0%	2/6	33%
	Hum.	5/7	71%	0/7	0%	0/7	0%	0/7	0%	2/7	29%
	Scien.	7/9	78%	2/9	22%	0/9	0%	0/9	0%	0/9	0%
	Total	**15/22**	**68%**	**2/22**	**9%**	**1/22**	**4%**	**0/22**	**0%**	**4/22**	**18%**

1.5.2 The choice of the dictionary

Thanks to the modern technological tool, today it is possible to choose between several types of dictionaries: paper dictionaries, on-line dictionaries or electronic dictionaries. Between them, on-line dictionaries are the most efficient option because they allow students to drag and drop the unknown word directly in the search bar. Electronic dictionaries are also quite handy, especially if the student has not the chance to copy the word from the digital file. On the contrary, paper dictionaries may turn out to be the less practical solution because searching page by page requires more time.

As emerges from a general overview of the collected data, on-line dictionaries are not only the most appreciated type of dictionary but also the most used learning tool by the majority of those examined in this questionnaire.

The foreign language students do represent an exception because the majority of them use electronic dictionaries, rather than on-line dictionaries.

Tab. 12 – The most used dictionaries.
Answers to the statements "40. I look for the unknown word in a paper dictionary", "41. I look for the unknown word in an on-line dictionary and I drag and drop the new word from the text in the search bar", "42. I use an electronic dictionary and I write letter by letter the unknown word in the search bar"

		Never		Rarely		Sometimes		Often		Always	
Statement	**Groups**	**1**		**2**		**3**		**4**		**5**	
40.	**Lang.**	2/6	33%	2/6	33%	1/6	17%	0/6	0%	1/6	17%
	Hum.	0/7	0%	2/7	29%	1/7	14%	2/7	29%	2/7	29%
	Scien.	1/9	11%	3/9	33%	3/9	33%	1/9	11%	1/9	11%
	Total	**3/22**	**14%**	**7/22**	**32%**	**5/22**	**23%**	**3/22**	**14%**	**4/22**	**18%**
41.	**Lang.**	0/6	0%	1/6	17%	3/6	50%	0/6	0%	2/6	33%
	Hum.	0/7	0%	1/7	14%	1/7	14%	1/7	14%	4/7	57%
	Scien.	1/9	11%	0/9	0%	2/9	22%	3/9	33%	3/9	33%
	Total	**1/22**	**4%**	**2/22**	**9%**	**6/22**	**27%**	**4/22**	**18%**	**9/22**	**41%**
42.	**Lang.**	0/6	0%	0/6	0%	1/6	17%	2/6	33%	3/6	50%
	Hum.	1/7	14%	1/7	14%	0/7	0%	2/7	29%	3/7	43%
	Scien.	3/9	33%	1/9	11%	2/9	22%	2/9	22%	1/9	11%
	Total	**4/22**	**18%**	**2/22**	**9%**	**3/22**	**14%**	**6/22**	**27%**	**7/22**	**32%**

1.5.3 Reading habits

None of the three groups are made up of bookworms exclusively: merely one student out of six in the foreign languages group always reads in L2, while the remaining read sporadically. The other two groups have even higher percentages of non-readers: 57% of the liberal arts students rarely read in L2, whereas 67% of the scientific area never reads books in a foreign language.

Tab. 13 - The relationship of the students with foreign language books.
Answers to the statement "36. I read books in L2"

		Never		Rarely		Sometimes		Often		Always	
Statement	**Groups**	**1**		**2**		**3**		**4**		**5**	
36.	**Lang.**	0/6	0%	2/6	33%	3/6	50%	0/6	0%	1/6	17%
	Hum.	2/7	29%	4/7	57%	0/7	0%	1/7	14%	0/7	0%
	Scien.	6/9	67%	1/9	11%	2/9	22%	0/9	0%	0/9	0%
	Total	**8/22**	**36%**	**7/22**	**32%**	**5/22**	**23%**	**1/22**	**4%**	**1/22**	**4%**

1.5.4 The role of the teachers and the fellow-students

In the foreign language acquisition process, university students are generally surrounded by fellow-students and teachers and these figures may be useful learning tools.

During the lecture, if the student does not know a word he may ask the teacher for the translation or for an example. Moreover, students may meet in the afternoon in order to read together, explain the lesson to each other or just to focus on difficult topics.

With respect to the relationship between the student and the teacher, there is a higher rate of students that prefer asking for the meaning of an unknown word to the teacher, and not to the fellow-students. This trend is common to all the groups, like table 14 shows.

Tab. 14 – The relation of the students with their teachers and fellow-students.
Answers to the statements "34. I ask the teacher for the paraphrasis, the translation or the synoym of the unknown word", "39. I study with my fellow-students to ask for the meaning of the unknown word"

		Never		Rarely		Sometimes		Often		Always	
Statement	Groups	**1**		**2**		**3**		**4**		**5**	
34.	**Lang.**	2/6	33%	0/6	0%	1/6	17%	1/6	17%	2/6	33%
	Hum.	2/7	29%	0/7	0%	4/7	57%	0/7	0%	1/7	14%
	Scien.	2/9	22%	1/9	11%	2/9	22%	2/9	22%	2/9	22%
	Total	**6/22**	**27%**	**1/22**	**4%**	**7/22**	**32%**	**3/22**	**14%**	**5/22**	**23%**
39.	**Lang.**	1/6	17%	0/6	0%	2/6	33%	2/6	33%	1/6	17%
	Hum.	4/7	57%	1/7	14%	1/7	14%	0/7	0%	1/7	14%
	Scien.	2/9	22%	2/9	22%	2/9	22%	1/9	11%	2/9	22%
	Total	**7/22**	**32%**	**3/22**	**14%**	**5/22**	**23%**	**3/22**	**14%**	**4/22**	**18%**

Furthermore, the students were asked if they are used to reading out loud with their mates. Their answers show that the vast majority of all the groups do not use

this learning strategy. Just a small percentage of the linguistic and scientific areas reads and repeats with the fellow-students, whereas a really high percentage of liberal arts students never study with the fellow-students.

Tab. 15 – The relation of the participants with their fellow-students.
Answers to the statements "37. I study with my fellow-students to read the texts that the teacher wants us to read", "38. I study with my fellow-students to repeat the meaning of the new words aloud"

		Never		Rarely		Sometimes		Often		Always	
Statement	Groups	**1**		**2**		**3**		**4**		**5**	
37.	**Lang.**	2/6	33%	1/6	17%	1/6	17%	1/6	17%	1/6	17%
	Hum.	5/7	71%	1/7	14%	1/7	14%	0/7	0%	0/7	0%
	Scien.	4/9	44%	1/9	11%	1/9	11%	2/9	22%	1/9	11%
	Total	**11/22**	**50%**	**3/22**	**14%**	**3/22**	**14%**	**3/22**	**14%**	**2/22**	**9%**
38.	**Lang.**	1/6	17%	1/6	17%	1/6	17%	2/6	33%	1/6	17%
	Hum.	6/7	86%	0/7	0%	0/7	0%	0/7	0%	1/7	14%
	Scien.	5/9	56%	0/9	0%	1/9	11%	3/9	33%	0/9	0%
	Total	**12/22**	**55%**	**1/22**	**4%**	**2/22**	**9%**	**5/22**	**23%**	**2/22**	**9%**

1.5.5 Repetition or association activities

Some people benefit from repetition, namely, they consider it a useful strategy to retain lexical items in memory. Others prefer associating new words to already known words or to words that sound in a similar way.

Between the written and the oral repetition the majority of all the participants prefer to read a new word out loud one or more times.

The oral repetition is the second most used learning strategy second only to the on-line dictionaries (refer table 16).

Tab. 16 – The usage of repetition activities.
Answers to the statements "43. I write the same word more times on a piece of paper", "44. I repeat the word aloud more times"

		Never		Rarely		Sometimes		Often		Always	
Statements	Groups	**1**		**2**		**3**		**4**		**5**	
43.	**Lang.**	1/6	17%	0/6	0%	2/6	33%	3/6	50%	0/6	0%
	Hum.	2/7	29%	2/7	29%	1/7	14%	1/7	14%	1/7	14%
	Scien.	3/9	33%	1/9	11%	1/9	11%	1/9	11%	1/9	11%
	Total	**6/22**	**27%**	**3/22**	**14%**	**4/22**	**18%**	**5/22**	**23%**	**2/22**	**9%**
44.	**Lang.**	1/6	17%	0/6	0%	1/6	17%	2/6	33%	2/6	33%
	Hum.	2/7	29%	0/7	0%	2/7	29%	1/7	14%	2/7	29%
	Scien.	0/9	0%	0/9	0%	3/9	33%	3/9	33%	3/9	33%
	Total	**3/22**	**14%**	**0/22**	**0%**	**6/22**	**27%**	**6/22**	**27%**	**7/22**	**32%**

Apart from the mere repetition students may use association strategies: they may either associate the meaning of the new word to other words or its sound to words that sound in a similar way. As table 17 shows, association strategies, and especially sound-association strategies, are quite widespread between all the groups, except for the scientific sector where there are fewer students that rely on phonics to memorize new lexical items: they prefer to associate the written word.

Tab. 17 – The frequency of association strategies used by the students.
Answers to the statements "45. I associate the word to other similar words that I already know", "57. I associate the sound of the new word to a word that sounds in a similar way that I already know"

		Never		Rarely		Sometimes		Often		Always	
Statements	Groups	**1**		**2**		**3**		**4**		**5**	
45.	**Lang.**	0/6	0%	1/6	17%	1/6	17%	3/6	50%	1/6	17%
	Hum.	0/7	0%	0/7	0%	3/7	43%	3/7	43%	1/7	14%
	Scien.	0/9	0%	2/9	22%	3/9	33%	2/9	22%	2/9	22%
	Total	**0/22**	**0%**	**3/22**	**14%**	**7/22**	**32%**	**8/22**	**36%**	**4/22**	**18%**
57.	**Lang.**	0/6	0%	0/6	0%	3/6	50%	2/6	33%	1/6	17%
	Hum.	0/7	0%	1/7	14%	2/7	29%	2/7	29%	2/7	29%
	Scien.	2/9	22%	1/9	11%	4/9	44%	1/9	11%	1/9	11%
	Total	**2/22**	**9%**	**2/22**	**9%**	**9/22**	**41%**	**5/22**	**23%**	**4/22**	**28%**

1.5.6 Word-structure analysis

Word-structure analysis, that is, the observation of the elements of the new word, is not a widespread strategy to memorize new lexicon: the general trend shows that almost all the students rarely look at the elements that constitute a word, such as the affixes.

For example, with respect to prefixes and suffixes, just one student in the foreign languages area and one in the scientific sector claim to always divide the unknown words into parts to understand its meaning. The majority of the liberal arts and science students never consider the affixes to memorize the new lexical items.

Words can be dismantled also by taking into account their syllables, either in their written form or in oral production. Syllable structure analysis does not seem to be very appreciated, especially if the students have to rewrite the word on a piece of paper by dividing it into syllables with some hyphens. Instead, they prefer repeating the new lexical items orally by focusing on their rhythm, as table 18 indicates.

Tab. 18 – The relation of the students with word structure analysis.
Answers to the statements "50. I divide the word into smaller parts (suffixes and prefixes) in order to understand how it is made", "51. I rewrite the word by dividing it into syllables separated by hyphens", "52. I repeat the word orally by stressing its rhythm"

		Never		Rarely		Sometimes		Often		Always	
Statements	Groups	**1**		**2**		**3**		**4**		**5**	
50.	**Lang.**	1/6	17%	1/6	17%	2/6	33%	1/6	17%	1/6	17%
	Hum.	4/7	57%	1/7	14%	2/7	29%	0/7	0%	0/7	0%
	Scien.	5/9	56%	0/9	0%	2/9	22%	1/9	11%	1/9	11%
	Total	**10/22**	**45%**	**2/22**	**9%**	**6/22**	**27%**	**2/22**	**9%**	**2/22**	**9%**
51.	**Lang.**	3/6	50%	1/6	17%	2/6	33%	0/6	0%	0/6	0%
	Hum.	4/7	57%	2/7	29%	1/7	14%	0/7	0%	0/7	0%
	Scien.	8/9	89%	1/9	11%	0/9	0%	0/9	0%	0/9	0%
	Total	**15/22**	**68%**	**4/22**	**18%**	**3/22**	**14%**	**0/22**	**0%**	**0/22**	**0%**
52.	**Lang.**	2/6	33%	1/6	17%	1/6	17%	0/6	0%	2/6	33%
	Hum.	4/7	57%	1/7	14%	1/7	14%	0/7	0%	1/7	14%
	Scien.	0/9	0%	2/9	22%	3/9	33%	3/9	33%	1/9	11%
	Total	**6/22**	**27%**	**4/22**	**18%**	**5/22**	**23%**	**3/22**	**14%**	**4/22**	**18%**

Hence, compared to other strategies already quoted, word structure analysis is not as widespread as other strategies are and the analysis of the syllables is even the less used strategy of all the strategies mentioned in this questionnaire.

1.5.7 Visual organizational skills

Visual strategies are not really common between these three groups.

Tags to glue on the objects and symbols to represent the new lexical items are not widespread learning tools, especially in the scientific area. Interestingly, a higher percentage of students prefer using symbols, instead of tags for translation purposes, to memorize the new lexical item. This may be linked to the choice of their academic course and the usage of scientific symbols in other subjects and therefore the trend to use them in the linguistic field as well.

In comparison to tags and symbols, the majority of the participants prefer to make a picture of the new lexical item and to write the name next to it. Just the foreign language area prefers tags as opposed to pictures.

Even if outlines are quite widespread as a memorization strategy to organize the new lexicon, not all the groups consider them really useful: whereas 33% of the linguistic area never uses outlines, 44% of the scientific sector often organizes the lexicon with outlines. The liberal arts students stay in a neutral position: on the one hand almost half the group never use them, on the other hand the remaining part use them now and then.

Tab. 19 – The frequency of the visual strategies used by the students.
Answers to the statements "46. I create some tags and I glue them on the object of the unknown word", "47. I draw the picture of the new word and next to it I write its name", "48. I draw a symbol and next to it I write the name of the corresponding abstract noun", "49. I create outlines in order to link words that have something in common"

		Never		Rarely		Sometimes		Often		Always	
Statements	Groups	**1**		**2**		**3**		**4**		**5**	
46.	**Lang.**	3/6	50%	1/6	17%	0/6	0%	1/6	17%	1/6	17%
	Hum.	3/7	43%	0/7	0%	1/7	14%	2/7	29%	1/7	14%
	Scien.	6/9	67%	1/9	11%	2/9	22%	0/9	0%	0/9	0%
	Total	**12/22**	**55%**	**2/22**	**9%**	**3/22**	**14%**	**3/22**	**14%**	**2/22**	**9%**
47.	**Lang.**	1/6	17%	2/6	33%	1/6	17%	2/6	33%	0/6	0%
	Hum.	3/7	43%	1/7	14%	1/7	14%	1/7	14%	1/7	14%
	Scien.	3/9	33%	3/9	33%	1/9	11%	1/9	11%	1/9	11%
	Total	**7/22**	**32%**	**6/22**	**27%**	**3/22**	**14%**	**4/22**	**18%**	**2/22**	**9%**
48.	**Lang.**	2/6	33%	2/6	33%	1/6	17%	0/6	0%	1/6	17%
	Hum.	3/7	43%	2/7	29%	1/7	14%	1/7	14%	0/7	0%
	Scien.	4/9	44%	2/9	22%	0/9	0%	2/9	22%	1/9	11%
	Total	**9/22**	**41%**	**6/22**	**27%**	**2/22**	**9%**	**3/22**	**14%**	**2/22**	**9%**
49.	**Lang.**	2/6	33%	1/6	17%	1/6	17%	1/6	17%	1/6	17%
	Hum.	3/7	43%	0/7	0%	1/7	14%	2/7	29%	1/7	14%
	Scien.	1/9	11%	0/9	0%	3/9	33%	4/9	44%	1/9	11%
	Total	**6/22**	**27%**	**1/22**	**4%**	**5/22**	**23%**	**7/22**	**32%**	**3/22**	**14%**

1.5.8 Phonetic transcription abilities

The students were also asked about their phonetic transcription abilities. Surprisingly, just 33% of foreign language students always take advantage of the phonetic transcription when they read the new word in the dictionary. They prefer the speech synthesizer of a translator to hear the sound of the unknown words or a personal transcription, made of the letters of their L1 alphabet, rather than the written IPA transcription (International Phonetic Alphabet). The same pattern can be observed in the other groups, where the IPA is even less used.

Hence, a general overview shows that the transcription with the alphabet of the L1 is the third most used memorization strategy, particularly useful for remembering the sound of the unknown word.

Tab. 20 – The phonetic abilities of the students.
Answers to the statements "54. I read the phonematic transcription of the word that I find in the dictionary next to the lexeme", "55. I use the speech synthesizer of a translator to hear the sound of the unknown word", "56. I write next to the word a transcription with the alphabet of my L1"

		Never		Rarely		Sometimes		Often		Always	
Statements	Groups	**1**		**2**		**3**		**4**		**5**	
54.	**Lang.**	2/6	33%	1/6	17%	1/6	17%	0/6	0%	2/6	33%
	Hum.	3/7	43%	1/7	14%	2/7	29%	1/7	14%	0/7	0%
	Scien.	4/9	44%	0/9	0%	2/9	22%	2/9	22%	1/9	11%
	Total	**9/22**	**41%**	**2/22**	**9%**	**5/22**	**23%**	**3/22**	**14%**	**3/22**	**14%**
55.	**Lang.**	1/6	17%	0/6	0%	3/6	50%	0/6	0%	2/6	33%
	Hum.	3/7	43%	2/7	29%	0/7	0%	1/7	14%	1/7	14%
	Scien.	2/9	22%	0/9	0%	1/9	11%	2/9	22%	4/9	44%
	Total	**6/22**	**27%**	**2/22**	**9%**	**4/22**	**18%**	**3/22**	**14%**	**7/22**	**32%**
56.	**Lang.**	1/6	17%	1/6	17%	0/6	0%	3/6	50%	1/6	17%
	Hum.	1/7	14%	2/7	29%	2/7	29%	1/7	14%	1/7	14%
	Scien.	0/9	0%	0/9	0%	2/9	22%	4/9	44%	3/9	33%
	Total	**2/22**	**9%**	**3/22**	**14%**	**4/22**	**18%**	**8/22**	**36%**	**5/22**	**23%**

1.5.9 List of words

Even if it is not a very widespread strategy, there are some students who create lists of unknown words quite often: the foreign language and the scientific groups use this strategy more frequently than those in the human studies area, as table 21 indicates.

Tab. 21 – The usage of listing activities.
Answers to the statement "53. I write a list of words and I put them in alphabetical order. I write next to them the translation in my L1"

		Never		Rarely		Sometimes		Often		Always	
Statement	Groups	**1**		**2**		**3**		**4**		**5**	
53.	**Lang.**	1/6	17%	1/6	17%	2/6	33%	0/6	0%	2/6	33%
	Hum.	2/7	29%	1/7	14%	3/7	43%	0/7	0%	1/7	14%
	Scien.	2/9	22%	1/9	11%	3/9	33%	0/9	0%	3/9	33%
	Total	**5/22**	**23%**	**3/22**	**14%**	**8/22**	**36%**	**0/22**	**0%**	**6/22**	**27%**

1.6 The points of view of the students about their academic results

Irrespective of the learning strategy that the students use, almost everybody believes that the choice of one strategy instead of another plays a crucial role in foreign language acquisition. In the liberal arts area alone, 14% totally disagree with the usefulness of appropriate learning strategies.

However, with respect to their academic results, the linguistic area is the most satisfied group: the vast majority claim to have reached good or even excellent results with the used learning strategies. Only one student out of six evaluates her results with a passing grade.

In the human studies area the grade of attainment is somewhat lower. Just 43% consider their results as satisfactory. The remaining area is distributed between unsatisfactory, passing or passable grades.

To conclude, in the scientific area results are even lower, with a relatively high percentage of students that consider their results unsatisfactory.

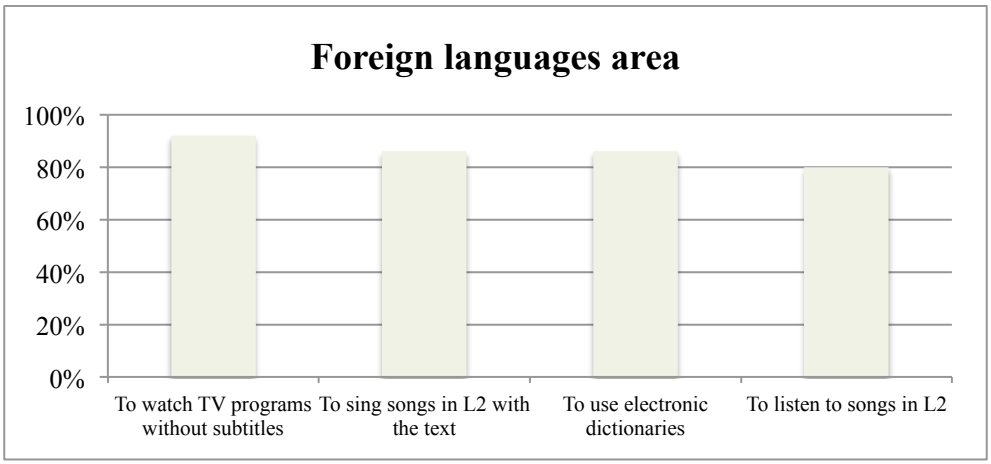
1.7 Discussion

Even if a high percentage of all the participants consider memorization strategies fundamental to reach academic success, not all the learning strategies are considered highly useful.

The three subgroups show different trends as regards the choice of the memorization strategies and it emerges that the choice of one strategy instead of another corresponds to different academic results.

The linguistic area, the most satisfied one, uses most of all pleasurable learning tools such as TV programs and songs in L2.

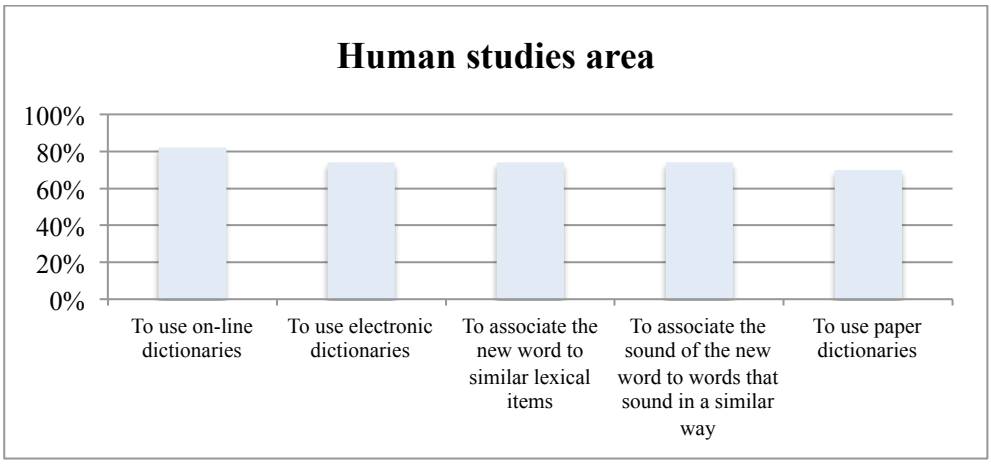
Bar chart 1 – The most used learning strategies in the foreign languages area



The liberal arts students prefer to widen their lexicon in a more traditional way, by looking for the unknown word in the vocabulary. The on-line dictionary is the most used, followed by electronic and paper dictionaries.

In the absence of dictionaries, they often use association strategies, which means they associate either the form of the new word to an already known word or its sound to a lexical item that has a similar phonetic structure.

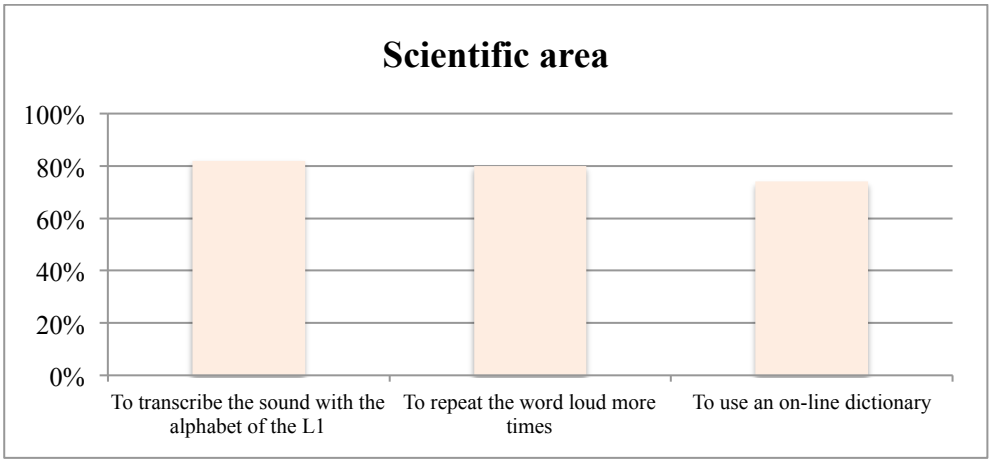
Bar chart 2 - The most used learning strategies in the human studies area



In order to memorize the sound of the new lexeme, the scientific sector often uses the alphabet of the L1 to write down the phonetic transcription of the word. This choice is related to the obvious absence of linguistics knowledge and for this reason they prefer a personal transcription rather than the IPA.

The second most widespread strategy is the repetition of the word, followed by the use of the on-line dictionary.

Bar chart 3 - The most used learning strategies in the scientific area



Hence, it is clear that the three groups have different attitudes to the above-mentioned learning strategies and it may be possible that this characteristic is correlated to their field of study.

As regards the choice of the vocabulary memorization strategies, the foreign languages students, who are the most satisfied participants, consider their academic results acceptable: within this group there is a higher percentage of students who have spent some time abroad studying. Moreover, a higher percentage of students belong to the foreign language group who have been diagnosed earlier than the other participants and maybe for these two reasons they have experienced less difficulties in comparison with the scientific area.

Even if the liberal arts students had no experiences abroad (just one student out of seven took part to an exchange program) they are also quite satisfied with respect to their academic results. This positive result may be linked to the early diagnosis of this group.

On the contrary, the scientific area is not really satisfied regarding their foreign language knowledge: within this group there are students that were diagnosed

between adolescence and adulthood and just two students out of nine had a study experience abroad.

To sum up, the vocabulary learning strategies that are linked to positive academic results are pleasurable learning tools, such as TV programs and songs in L2: hence, indirect learning materials may become useful memorization strategies to assist in foreign language acquisition.

1.8 Conclusions

The results of this research, which gives an overview of the most used vocabulary learning strategies in the foreign language acquisition process in dyslexia, show that, depending on the field of study and the past school experiences, students use different tools to improve their foreign language skills.

In order to investigate this topic, this body of work gleaned from the following research questions:

1. Which are the most used vocabulary learning strategies by the dyslexic students?
2. Is there a relation between the students' past school experiences, the choice of the appropriate strategies and their academic results?
3. Which learning strategies can be linked to positive academic results?

As regards the most used vocabulary learning strategies, the answers of the participants to the questions of the questionnaire clarified that some learning tools, such as on-line dictionaries, are common to several areas, whereas others, like for example TV programs for the foreign language group, association strategies for the liberal arts students and personal transcriptions with the L1 alphabet for the scientific area, characterize just some areas and not the whole sample.

On-line dictionaries are the most used learning tool, between all the examined strategies in this questionnaire, by the majority of the total number of participants and by the human studies area. On the contrary, the foreign language students prefer watching TV programs without subtitles (while the other two groups prefer

subtitled movies) and the scientific area prefer a personal transcription with the alphabet of the L1 of the meaning of the new word.

The oral repetition is the second most used learning strategy both by the whole sample and by the scientific area. The foreign language sector prefers singing a song in a foreign language by reading its text or using an electronic dictionary (this tool is also appreciated by the scientific area). The human studies area is more prone to association strategies.

The third most used learning strategies are the transcription with the alphabet of the L1 and music. Whereas foreign language students prefer singing a song in L2 by reading its text, the human studies area and the scientific group prefer listening to a song passively.

As to the relation between past school experiences and academic results, topic of the second research question, it emerged that the choice of one strategy instead of another influenced the academic results, an element that distinguished the three subgroups. This difference may be correlated to two important factors: the age of diagnosis of the learning disability and the participation to exchange programs abroad to improve one's L2 knowledge.

With regard to the learning strategies that influence positive academic results, the topic of the third question of this study, a noticeable result demonstrated that the students that were diagnosed earlier and that went abroad consider themselves more satisfied and have good academic results in foreign languages. Furthermore, they are able to reach positive outcomes by using pleasurable learning tools, which means technological tools that allow to improve one's foreign language

skills in an amusing way. This means that mature age students are the result of what they have been through in their past school experiences.

Hence, some interesting results emerged that highlight the differences between different study areas, even if the subgroups of the whole sample are not considerably large. For this reason, these findings are not conclusive and more studies with a higher number of students may give a completer overview of the most used learning strategies in foreign language acquisition and their correlation with dyslexia.

Apart from a larger sample, a completer overview may require a different organization in the questionnaire of the learning strategies: they may be divided into subtypes, by taking into account their category (cognitive, memory, determination, and social strategies may be grouped to make a category comparison).

For future surveys, it would be interesting to focus on other factors that may influence the choice of the vocabulary learning strategy, such as gender and cultural background. For example, this study may be continued by analysing the difference between male and female dyslexic students and the strategies adopted by dyslexic students from different cultural backgrounds to improve one's vocabulary skills. Another interesting factor that could be taken into account is the difference between students with different subtypes of learning disabilities. How does dyslexia influence the choice of vocabulary learning strategies and how do other types of disorders, such as dyscalculia, dysgraphia, dyspraxia or dysphasia, affect this choice?

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Appendix A

Il ruolo della memoria nelle strategie di apprendimento del lessico

Cari studenti,

sono una studentessa dell'Università Ca' Foscari di Venezia. Vi inoltro questo questionario che nasce con l'intenzione di raccogliere dei dati per la stesura della mia tesi di laurea magistrale. La compilazione non durerà più di 10 minuti. Si tratta di un questionario anonimo che vuole indagare sul rapporto degli studenti universitari con le proprie abilità di memoria. Le domande si focalizzano in particolare sulle strategie di memorizzazione del lessico che usano gli universitari nell'apprendimento di una lingua straniera.
Non ci sono risposte giuste o sbagliate. Siete liberi di rispondere, in base al vostro punto di vista e alla vostra esperienza accademica.

Per ulteriori chiarimenti scrivetemi pure all'indirizzo debora.sinatra90@gmail.com.

Grazie per il tempo dedicato al questionario

Debora Sinatra

*Campo obbligatorio

Dati personali

Età *

Nazionalità *

Genere *

- M
- F

Dati sul percorso scolastico

Cosa studi? *

Qual è la tua materia preferita? *

Quali lingue straniere hai studiato? *

Ti piace studiare una lingua straniera? *

- Sì
- No
- Nè sì, né no

Perché ti piace studiare una lingua straniera? *

Ritieni utile imparare una lingua straniera? *

- Decisamente sì
- Sì
- In parte
- No
- Decisamente no

Perché ritieni utile/inutile imparare una lingua straniera? *

Il tuo percorso scolastico si è svolto *

- In Italia
- All'estero
- Sia in Italia che all'estero

Hai mai partecipato ad uno scambio culturale (per esempio Erasmus)? *

- Sì
- No

Se sei mai stato all'estero, ritieni che un'esperienza fuori dall'Italia ti abbia aiutato nell'apprendimento di una lingua straniera? *

- Sì
- Mi ha aiutato solo in parte
- No

Se hai risposto sì alla domanda precedente, indica in quali settori hai riscontrato dei miglioramenti grazie all'esperienza all'estero

Credi di avere (o aver avuto in passato) maggiori difficoltà nell'apprendimento di una lingua straniera rispetto ai tuoi compagni di corso? *

- Sì
- No

Perché credi di aver avuto maggiori difficoltà?

In che settore hai avuto più difficoltà?

- Comprensione scritta
- Comprensione orale
- Produzione scritta
- Produzione orale

Durante il tuo percorso scolastico sei mai stato diagnosticato come studente con Disturbi Specifici dell'Apprendimento (DSA)? *

Vengono definiti DSA studenti con dislessia, disgrafia, disortografia e/o discalculia

- Sì
- No

A che età sei stato diagnosticato come studente DSA?

Riflessioni sulle proprie abilità mnemoniche

Ti piace memorizzare testi come poesie o copioni teatrali? *

- Sì
- No

Perché ti piace memorizzare testi? *

Quando devi memorizzare un testo tendi a ricordare maggiormente *

- L'inizio
- La fine
- Le parole chiave
- Il contenuto generale
- Alcune parti scollegate tra di loro

Per migliorare le tue competenze linguistiche hai bisogno di memorizzare soprattutto *

- Lessico
- Grammatica
- Frasi
- Modi di dire
- Dialoghi
- Altro:

Esprimi la tua opinione sulle tue abilità mnemoniche e sulla loro utilità nell'apprendimento delle lingue.
Assegna un valore della seguente scala
5 = Decisamente sì
4 = Sì
3 = In parte
2 = No
1= Decisamente no

Hai bisogno di tanto tempo per memorizzare parole nuove? *

	1	2	3	4	5	
Decisamente no						Decisamente sì

E' importante la motivazione per avere una buona memoria di ciò che si studia? *

	1	2	3	4	5	
Decisamente no						Decisamente sì

Per imparare una lingua è importante adottare delle strategie di memorizzazione? *

1 2 3 4 5

Decisamente no ✕ ✕ ✕ ✕ ✕ Decisamente sì

Dati sulle strategie di memorizzazione del lessico

"Cosa faccio per migliorare il vocabolario della lingua straniera che studio?"

Indica di seguito le strategie mnemoniche che usi maggiormente, segnando la tua preferenza in una scala da 5 a 1.
5 = sempre
4 = spesso
3 = a volte
2 = raramente
1 = mai

Ascolto canzoni in lingua straniera *

1 2 3 4 5

mai ✕ ✕ ✕ ✕ ✕ sempre

Canto canzoni in lingua straniera leggendone il testo *

1 2 3 4 5

mai ✕ ✕ ✕ ✕ ✕ sempre

Canto canzoni in lingua straniera ricordandone il testo a memoria *

1 2 3 4 5

mai ✕ ✕ ✕ ✕ ✕ sempre

Guardo programmi TV sottotitolati in lingua straniera *

1 2 3 4 5

mai ✕ ✕ ✕ ✕ ✕ sempre

Guardo programmi TV in lingua straniera senza sottotitoli *

1 2 3 4 5

mai ✕ ✕ ✕ ✕ ✕ sempre

Seleziono la lingua straniera nelle modalità di ricerca del mio internet browser *

1 2 3 4 5

mai sempre

Gioco con video games impostati in lingua straniera *

1 2 3 4 5

mai sempre

Chiedo al mio insegnante la parafrasi, la traduzione o un sinonimo del termine sconosciuto *

1 2 3 4 5

mai sempre

Chiedo al mio insegnante di fare un esempio con il termine nuovo

1 2 3 4 5

mai sempre

Leggo in lingua originale libri della letteratura straniera *

1 2 3 4 5

mai sempre

Studio in gruppo con i miei colleghi per leggere assieme i testi assegnati dai docenti *

1 2 3 4 5

mai sempre

Studio in gruppo per ripetere oralmente ai miei colleghi il significato delle parole che ho studiato *

1 2 3 4 5

mai sempre

Studio con i miei colleghi per chiedere dei chiarimenti sulle parole che non capisco *

1 2 3 4 5

mai sempre

Disegno dei simboli e accanto scrivo il nome dell'oggetto astratto corrispondente *

1 2 3 4 5

mai sempre

Creo delle mappe e collego le parole che hanno qualcosa in comune *

1 2 3 4 5

mai sempre

Scompongo la parola in parti più piccole (prefissi e suffissi) per capire come è formata *

1 2 3 4 5

mai sempre

Riscrivo la parola dividendola in sillabe con dei trattini tra una sillaba e l'altra *

1 2 3 4 5

mai sempre

Ripeto la parola oralmente scandendo il ritmo delle sillabe *

1 2 3 4 5

mai sempre

Creo una lista di parole sconosciute scritte in ordine alfabetico accanto alle quali riporto la traduzione nella mia lingua madre *

1 2 3 4 5

mai sempre

"Cosa faccio per ricordare i suoni delle parole?"

Indica di seguito il modo in cui memorizzi i suoni delle parole segnando la tua preferenza in una scala da 5 a 1
5 = sempre
4 = spesso
3 = a volte
2 = raramente
1 = mai

Cerco la parola sconosciuta su un dizionario cartaceo *

1 2 3 4 5

mai sempre

Cerco la parola sconosciuta su un dizionario on-line copiandola dal testo di origine e incollandola nella barra di ricerca *

1 2 3 4 5

mai sempre

Uso un dizionario elettronico scrivendo lettera per lettera la parola nuova *

1 2 3 4 5

mai sempre

Riscrivo più volte la parola su un foglio *

1 2 3 4 5

mai sempre

Ripeto più volte la parola ad alta voce *

1 2 3 4 5

mai sempre

Associo la parola ad altre parole simili che già conosco *

1 2 3 4 5

mai sempre

Creo delle etichette con i nomi concreti e le attacco sugli oggetti corrispondenti *

1 2 3 4 5

mai sempre

Disegno l'oggetto concreto e accanto scrivo il nome corrispondente *

1 2 3 4 5

mai sempre

Leggo la trascrizione fonematica che trovo nel dizionario accanto alla parola ricercata *

Per esempio house = /haʊs/

1 2 3 4 5

mai sempre

Uso il sintetizzatore vocale di un traduttore elettronico per riprodurre il suono delle parole *

1 2 3 4 5

mai sempre

Scrivo sulla parola una trascrizione personale con l'alfabeto della mia lingua madre *

1 2 3 4 5

mai sempre

Associo il suono della parola nuova al suono delle parole che già conosco *

1 2 3 4 5

mai sempre

Al di là delle strategie sopra elencate, usi altre strategie per memorizzare il lessico? Quali?

Quali strategie ritieni più utili per memorizzare il lessico della lingua straniera? Perché? *

Quali strategie ritieni più utili per memorizzare il lessico della lingua straniera? Perché? *

Quali strategie ritieni più intutili per memorizzare il lessico della lingua straniera? Perché? *

Secondo te, le tue strategie di memorizzazione influiscono sui tuoi risultati accademici? *

- Decisamente sì
- Sì
- In parte
- No
- Decisamente no

Come valuteresti i risultati che hai raggiunto nello studio delle lingue straniere con le tue strategie di apprendimento? *

- Ottimi
- Buoni
- Discreti
- Sufficienti
- Insufficienti

Invia

100%: completato.

Non inviare mai le password tramite Moduli Google.

Appendix B

Personal data

		Mean age
1. Age	Lang.	25.5
	Mum.	22.5
	Scien.	21.7

		Nationality
2. Nationality	Lang.	Italian
	Mum.	Italian
	Scien.	Italian

		Women		Men	
3. Gender	Lang.	5/6	83%	1/6	17%
	Mum.	4/7	57%	3/7	43%
	Scien.	9/9	100%	0/9	0%

Data about educational experience

		Quantity of students	
4. What do you study?	Lang.	6/22	27%
	Mum.	7/22	32%
	Scien.	9/22	41%

		Foreign languages		Literature		History		Philosophy		Law		Arts		Psychology		Geology		Palpation		Nothing	
5. What is your favourite subject?	Lang.	3/6	50%	1/6	17%	2/6	33%	0/6	0%	0/6	0%	0/6	0%	0/6	0%	0/6	0%	0/6	0%	0/6	0%
	Mum.	0/7	0%	0/7	0%	4/7	57%	0/7	0%	0/7	0%	0/7	0%	2/7	29%	0/7	0%	0/7	0%	1/7	14%
	Scien.	1/9	11%	0/9	0%	1/9	11%	1/9	11%	2/9	22%	2/9	22%	0/9	0%	1/9	11%	1/9	11%	0/9	0%

		English		French		Spanish		German		Russian		US		Japanese		Chinese		Korean	
6. Which languages have you studied?	Lang.	6/6	100%	3/6	50%	2/6	33%	1/6	17%	2/6	33%	1/6	17%	2/6	33%	1/6	17%	1/6	17%
	Mum.	7/7	100%	3/7	43%	1/7	14%	1/7	14%	0/7	0%	0/7	0%	0/7	0%	0/7	0%	0/7	0%
	Scien.	9/9	100%	4/9	44%	1/9	11%	3/9	33%	0/9	0%	0/9	0%	0/9	0%	0/9	0%	0/9	0%

		Yes		No		So so	
7. Do you like learning a L2?	Lang.	6/6	100%	0/6	0%	0/6	0%
	Mum.	1/7	14%	1/7	14%	5/7	71%
	Scien.	3/9	33%	5/9	56%	1/9	11%

		To understand other people, cultures and languages		Because of love for another country		To learn new sounds and expressions		To train memory		To travel to another country		To have more job opportunities		Do not like it	
8. Why do you like learning a L2?	Lang.	4/6	67%	2/6	33%	0/6	0%	0/6	0%	0/6	0%	2/6	33%	0/6	0%
	Mum.	2/7	28%	0/7	0%	1/7	14%	0/7	0%	1/7	14%	0/7	0%	3/7	43%
	Scien.	2/9	22%	0/9	0%	0/9	0%	1/9	11%	0/9	0%	0/9	0%	6/9	67%

		Yes, definitely		Yes		So so		No		Definitely not	
9. Do you think it is important to learn a foreign language?	Lang.	4/6	67%	2/6	33%	0/6	0%	0/6	0%	0/6	0%
	Mum.	3/7	43%	4/7	57%	0/7	0%	0/7	0%	0/7	0%
	Scien.	7/9	78%	2/9	22%	0/9	0%	0/9	0%	0/9	0%

		To understand other people		To travel to another country		To have better job opportunities		To widen one's intercultural knowledge		To widen one's cultural background	
10. Why do you think that learning language is worthwhile/useful?	Lang.	1/6	17%	1/6	17%	2/6	33%	3/6	50%	2/6	33%
	Mum.	1/7	14%	4/7	57%	2/7	29%	2/7	29%	0/7	0%
	Scien.	4/9	44%	1/9	11%	5/9	56%	1/9	11%	1/9	11%

		In Italy		Both in Italy and abroad		Abroad	
11. Where did you study?	Lang.	4/6	67%	2/6	33%	0/6	0%
	Mum.	7/7	100%	0/7	0%	0/7	0%
	Scien.	8/9	89%	1/9	11%	0/9	0%

		Yes		No	
12. Have you ever taken part to an exchange program?	Lang.	2/6	33%	4/6	67%
	Mum.	1/7	14%	6/7	86%
	Scien.	2/9	22%	7/9	78%

		Yes		Just a little bit		No	
13. Has your abroad experience been useful to learn a L2?	Lang.	5/6	83%	0/6	0%	1/6	17%
	Mum.	2/7	29%	3/7	43%	2/7	29%
	Scien.	5/9	56%	1/9	11%	3/9	33%

		Pronunciation		Comprehension		Vocabulary		Culture		Praxis		Communication		Academic success		Phonology		Expressions		Fluency	
14. If you answered yes to n. 13, what did you improve with your abroad experience?	Lang.	2/6	33%	0/6	0%	2/6	33%	1/6	17%	1/6	17%	0/6	0%	0/6	0%	0/6	0%	0/6	0%	0/6	0%
	Mum.	0/7	0%	0/7	0%	0/7	0%	0/7	0%	0/7	0%	1/7	14%	1/7	14%	1/7	14%	0/7	0%	1/7	14%
	Scien.	2/9	22%	0/9	0%	1/9	11%	0/9	0%	0/9	0%	1/9	11%	0/9	0%	0/9	0%	0/9	0%	2/9	22%

		Yes		No	
15. Do you think that you have experienced more difficulties than your fellows in L2 acquisition?	Lang.	5/6	83%	1/6	17%
	Mum.	6/7	86%	1/7	14%
	Scien.		100%	0/9	0%

		Memory impairment		Dyslexia		Poor vocabulary		Dislike of the language		Difficult orthography		Unskilled teachers		No extratime allowed		Poor comprehension		No dispensatory and compensatory measures	
16. Why did you experience exam difficulties?	Lang.	2/6	33%	1/6	17%	1/6	17%	0/6	0%	1/6	17%	0/6	0%	0/6	0%	0/6	0%	0/6	0%
	Mum.	0/7	0%	0/7	0%	0/7	0%	0/7	0%	3/7	43%	1/7	14%	1/7	14%	0/7	0%	0/7	0%
	Scien.	4/9	44%	1/9	11%	0/9	0%	0/9	0%	0/9	0%	0/9	0%	2/9	22%	1/9	11%	2/9	22%

		Reading		Listening		Writing		Speaking	
17. In which areas did you experience exam difficulties?	Lang.	3/6	50%	0/6	0%	1/6	17%	1/6	17%
	Mum.	2/7	29%	0/7	0%	4/7	57%	1/7	14%
	Scien.	2/9	22%	2/9	22%	4/9	44%	1/9	11%

		Yes		No	
18. Have you been diagnosed with dyslexia?	Lang.	6/6	100%	0/6	0%
	Mum.	7/7	100%	0/7	0%
	Scien.	9/9	100%	0/9	0%

		From 6 to 10		From 10 to 14		From 14 to 18		From 18 to 35	
19. When did you receive a diagnosis?	Lang.	4/6	67%	0/6	0%	0/6	0%	2/6	33%
	Mum.	3/7	43%	2/7	29%	2/7	29%	0/7	0%
	Scien.	0/9	0%	0/9	0%	7/9	78%	2/9	22%

		Yes		No	
20. Do you like memorizing poems or scripts?	Lang.	2/6	33%	4/6	67%
	Mum.	2/7	29%	5/7	71%
	Scien.	2/9	22%	7/9	78%

		You do not have to build your own discourse		Just sentences or songs		Just scripts		To remember new vocabulary		It is useful to learn		For pleasure	
21. Why do you like memorizing texts?	Lang.	1/6	17%	0/6	0%	0/6	0%	0/6	0%	0/6	0%	2/6	33%
	Mum.	0/7	0%	1/7	14%	1/7	14%	0/7	0%	1/7	14%	0/7	0%
	Scien.	0/9	0%	0/9	50%	1/9	11%	2/9	22%	0/9	0%	0/9	0%

		The beginning		The end		Key words		The general meaning		Some unrelated parts	
22. What do you memorize more easily of a new text?	Lang.	1/6	17%	0/6	0%	2/6	33%	2/6	33%	1/6	17%
	Mum.	1/7	14%	0/7	0%	1/7	14%	3/7	43%	2/7	29%
	Scien.	2/9	22%	0/9	0%	1/9	11%	5/9	56%	1/9	11%

		Vocabulary		Grammar		Sentences		Idiomatic expressions		Dialogues		Other	
23. What do you have to memorize to improve your L2 skills?	Lang.	4/6	67%	0/6	0%	0/6	0%	2/6	33%	0/6	0%	0/6	0%
	Mum.	3/7	43%	1/7	14%	1/7	14%	0/7	0%	1/7	14%	1/7	14%
	Scien.	5/9	56%	2/9	22%	1/9	11%	1/9	11%	1/9	11%	0/9	0%

Data about personal memory skills

		Definitely not		No		So so		Yes		Yes, definitely	
		1		2		3		4		5	
24. Do you need a lot of time to memorize new lexical items?	Lang.	0/6	0%	0/6	0%	0/6	0%	4/6	67%	2/6	33%
	Mum.	0/7	0%	0/7	0%	4/7	57%	1/7	14%	2/7	29%
	Scien.	0/9	0%	1/9	11%	1/9	11%	4/9	44%	3/9	33%
25. Is motivation important to remember what you study?	Lang.	0/6	0%	0/6	0%	0/6	0%	2/6	33%	4/6	67%
	Mum.	0/7	0%	0/7	0%	0/7	0%	0/7	0%	7/7	100%
	Scien.	0/9	0%	1/9	11%	2/9	22%	3/9	33%	3/9	33%
26. Are mnemonic strategies important to learn a foreign language?	Lang.	0/6	0%	0/6	0%	0/6	0%	1/6	17%	5/6	83%
	Mum.	0/7	0%	0/7	0%	1/7	14%	0/7	0%	6/7	86%
	Scien.	0/9	0%	0/9	0%	1/9	11%	2/9	22%	6/9	67%

		Never		Rarely		Sometimes		Often		Always	
		1		2		3		4		5	
27. I have to songs in L2	Lang.	0/6	0%	1/6	17%	1/6	17%	1/6	17%	3/6	50%
	Mum.	0/7	0%	2/7	29%	2/7	29%	2/7	29%	1/7	14%
	Scien.	0/9	0%	2/9	22%	2/9	22%	3/9	33%	2/9	22%
28. I sing a song in L2 by reading its text	Lang.	0/6	0%	0/6	0%	2/6	33%	0/6	0%	4/6	67%
	Mum.	4/7	57%	1/7	14%	0/7	0%	1/7	14%	1/7	14%
	Scien.	1/9	11%	3/7	43%	2/7	29%	2/9	22%	1/9	11%
29. I sing by remembering the text from memory	Lang.	0/6	0%	1/6	17%	0/6	0%	2/6	33%	2/6	33%
	Mum.	3/7	43%	0/7	0%	2/7	29%	2/7	29%	0/7	0%
	Scien.	3/9	33%	0/9	0%	2/9	22%	4/9	44%	0/9	0%
30. I watch TV programs in L2 with subtitles	Lang.	2/6	33%	1/6	17%	1/6	17%	0/6	0%	2/6	33%
	Mum.	1/7	14%	1/7	14%	3/7	43%	1/7	14%	1/7	14%
	Scien.	4/9	44%	0/9	0%	2/9	22%	2/9	22%	1/9	11%
31. I watch TV programs in L2 without subtitles	Lang.	0/6	0%	0/6	0%	1/6	17%	0/6	0%	5/6	83%
	Mum.	2/7	29%	2/7	29%	2/7	29%	1/7	14%	0/7	0%
	Scien.	8/9	89%	1/9	11%	0/9	0%	0/9	0%	0/9	0%
32. I set up the L2 in my internet browser	Lang.	3/6	50%	0/6	0%	0/6	0%	0/6	0%	3/6	50%
	Mum.	4/7	57%	0/7	0%	2/7	29%	0/7	0%	1/7	14%
	Scien.	6/9	67%	3/9	33%	0/9	0%	0/9	0%	0/9	0%
33. I set up my colleagues in L2	Lang.	3/6	50%	0/6	0%	1/6	17%	0/6	0%	2/6	33%
	Mum.	5/7	71%	0/7	0%	0/7	0%	0/7	0%	2/7	29%
	Scien.	7/9	78%	2/9	22%	0/9	0%	0/9	0%	0/9	0%
34. I ask the teacher for the morphosis, the translation or the synonym of the unknown word	Lang.	2/6	33%	0/6	0%	1/6	17%	1/6	17%	2/6	33%
	Mum.	2/7	29%	0/7	0%	4/7	57%	0/7	0%	1/7	14%
	Scien.	2/9	22%	1/9	11%	2/9	22%	2/9	22%	2/9	22%
35. I ask the teacher for an example in L2 that contains the new words	Lang.	2/6	33%	1/6	17%	1/6	17%	1/6	17%	1/6	17%
	Mum.	2/7	29%	0/7	0%	2/7	29%	3/7	43%	0/7	0%
	Scien.	1/9	11%	4/9	44%	1/9	11%	3/9	33%	0/9	0%
36. I read books in L2	Lang.	0/6	0%	2/6	33%	3/6	50%	0/6	0%	1/6	17%
	Mum.	2/7	29%	4/7	57%	0/7	0%	1/7	14%	0/7	0%
	Scien.	6/9	67%	1/9	11%	2/9	22%	0/9	0%	0/9	0%
37. I study with my fellow students to read the texts that the teacher wants us to read	Lang.	2/6	33%	1/6	17%	1/6	17%	1/6	17%	1/6	17%
	Mum.	5/7	71%	1/7	14%	1/7	14%	0/7	0%	0/7	0%
	Scien.	4/9	44%	1/9	11%	1/9	11%	2/9	22%	1/9	11%
38. I study with my fellow students to repeat the meaning of the new words aloud	Lang.	1/6	17%	1/6	17%	1/6	17%	2/6	33%	1/6	17%
	Mum.	6/7	86%	0/7	0%	0/7	0%	0/7	0%	1/7	14%
	Scien.	5/9	56%	0/9	0%	1/9	11%	3/9	33%	0/9	0%
39. I study with my fellow students to ask for the meaning of the unknown words	Lang.	1/6	17%	0/6	0%	2/6	33%	2/6	33%	1/6	17%
	Mum.	4/7	57%	1/7	14%	1/7	14%	0/7	0%	1/7	14%
	Scien.	2/9	22%	2/9	22%	2/9	22%	1/9	11%	2/9	22%
40. I look for the unknown word in a paper dictionary	Lang.	2/6	33%	2/6	33%	1/6	17%	0/6	0%	1/6	17%
	Mum.	0/7	0%	2/7	29%	1/7	14%	2/7	29%	2/7	29%
	Scien.	1/9	11%	3/9	33%	3/9	33%	1/9	11%	1/9	11%

41. I look for the unknown word in an on-line dictionary and I write down the word I want from the text in the search bar	Lang.	0/6	0%	1/6	17%	3/6	50%	0/6	0%	2/6	33%
	Mum.	0/7	0%	1/7	14%	1/7	14%	1/7	14%	4/7	57%
	Scien.	1/9	11%	0/9	0%	2/9	22%	3/9	33%	3/9	33%
42. I use an electronic dictionary and I write down in order the unknown word in the search bar	Lang.	0/6	0%	0/6	0%	1/6	17%	2/6	33%	3/6	50%
	Mum.	1/7	14%	1/7	14%	0/7	0%	2/7	29%	3/7	43%
	Scien.	3/9	33%	1/9	11%	2/9	22%	2/9	22%	1/9	11%
43. I write the same word more times on a piece of paper	Lang.	1/6	17%	0/6	0%	2/6	33%	3/6	50%	0/6	0%
	Mum.	2/7	29%	2/7	29%	1/7	14%	1/7	14%	1/7	14%
	Scien.	3/9	33%	1/9	11%	1/9	11%	1/9	11%	1/9	11%
44. I repeat the word about more times	Lang.	1/6	17%	0/6	0%	1/6	17%	2/6	33%	2/6	33%
	Mum.	2/7	29%	0/7	0%	2/7	29%	1/7	14%	2/7	29%
	Scien.	0/9	0%	0/9	0%	3/9	33%	3/9	33%	3/9	33%
45. I associate the word to other similar words that I already know	Lang.	0/6	0%	1/6	17%	1/6	17%	3/6	50%	1/6	17%
	Mum.	0/7	0%	0/7	0%	3/7	43%	3/7	43%	1/7	14%
	Scien.	0/9	0%	2/9	22%	3/9	33%	2/9	22%	2/9	22%
46. I create some sags and gaps in the shape of the unknown word	Lang.	3/6	50%	1/6	17%	0/6	0%	1/6	17%	1/6	17%
	Mum.	3/7	43%	0/7	0%	1/7	14%	2/7	29%	1/7	14%
	Scien.	6/9	67%	1/9	11%	2/9	22%	0/9	0%	0/9	0%
47. I draw the picture of the new word and next to it I write its name	Lang.	1/6	17%	2/6	33%	1/6	17%	2/6	33%	0/6	0%
	Mum.	3/7	43%	1/7	14%	1/7	14%	1/7	14%	1/7	14%
	Scien.	3/9	33%	3/9	33%	1/9	11%	1/9	11%	1/9	11%
48. I draw a symbol and next to it I write the name of the corresponding abstract noun	Lang.	2/6	33%	2/6	33%	1/6	17%	0/6	0%	1/6	17%
	Mum.	3/7	43%	2/7	29%	1/7	14%	1/7	14%	0/7	0%
	Scien.	4/9	44%	2/9	22%	0/9	0%	2/9	22%	1/9	11%
49. I create outlines in order to link words that have something in common	Lang.	2/6	33%	1/6	17%	1/6	17%	1/6	17%	1/6	17%
	Mum.	3/7	43%	0/7	0%	1/7	14%	2/7	29%	1/7	14%
	Scien.	1/9	11%	0/9	0%	1/1	33%	4/9	44%	1/9	11%
50. I obtain the word into smaller parts (suffixes and prefixes) in order to understand how it is made	Lang.	1/6	17%	1/6	17%	2/6	33%	1/6	17%	1/6	17%
	Mum.	4/7	57%	1/7	14%	2/7	29%	0/7	0%	0/7	0%
	Scien.	5/9	56%	0/9	0%	2/9	22%	1/9	11%	1/9	11%
51. I create the word by using the syllables that are separated by hyphens	Lang.	3/6	50%	1/6	17%	2/6	33%	0/6	0%	0/6	0%
	Mum.	4/7	57%	2/7	29%	1/7	14%	0/7	0%	0/7	0%
	Scien.	8/9	89%	1/9	11%	0/9	0%	0/9	0%	0/9	0%
52. I repeat the word orally by stressing its rhythm	Lang.	2/6	33%	1/6	17%	1/6	17%	0/6	0%	2/6	33%
	Mum.	4/7	57%	1/7	14%	1/7	14%	0/7	0%	1/7	14%
	Scien.	0/9	0%	2/9	22%	3/9	33%	3/9	33%	1/9	11%
53. I write a list of words and put them in alphabetical order (e.g. I write the translation in my L1	Lang.	1/6	17%	1/6	17%	2/6	33%	0/6	0%	2/6	33%
	Mum.	2/7	29%	1/7	14%	3/7	43%	0/7	0%	1/7	14%
	Scien.	2/9	22%	1/9	11%	3/9	33%	0/9	0%	3/9	33%
54. I read the phonematic transcription of the word that I find in the dictionary next to the lemma	Lang.	2/6	33%	1/6	17%	1/6	17%	0/6	0%	2/6	33%
	Mum.	3/7	43%	1/7	14%	2/7	29%	1/7	14%	0/7	0%
	Scien.	4/9	44%	0/9	0%	2/9	22%	2/9	22%	1/9	11%
55. I use the speech synthesizer of a translator to hear the sound of the unknown words	Lang.	1/6	17%	0/6	0%	3/6	50%	0/6	0%	2/6	33%
	Mum.	3/7	43%	2/7	29%	0/7	0%	1/7	14%	1/7	14%
	Scien.	2/9	22%	0/9	0%	1/9	11%	2/9	22%	4/9	44%
56. I write down in the word a sentence in which I use the alphabet of my L1	Lang.	1/6	17%	1/6	17%	0/6	0%	1/2	50%	1/6	17%
	Mum.	1/7	14%	2/7	29%	2/7	29%	1/7	14%	1/7	14%
	Scien.	0/9	0%	0/9	0%	2/9	22%	4/9	44%	3/9	33%
57. I associate the sound of the new word to a word that sounds in a similar way that I already know	Lang.	0/6	0%	0/6	0%	3/6	50%	2/6	33%	1/6	17%
	Mum.	0/7	0%	1/7	14%	2/7	29%	2/7	29%	2/7	29%
	Scien.	2/9	22%	1/9	11%	4/9	44%	1/9	11%	1/9	11%

		Definitely not		No		So so		Yes		Yes, definitely	
58. Do you believe that your learning strategies influence your academic results?	Lang.	0/6	0%	0/6	0%	1/6	17%	3/6	50%	2/6	33%
	Mum.	1/7	14%	0/7	0%	1/7	14%	2/7	29%	3/7	43%
	Scien.	0/9	0%	0/9	0%	3/9	33%	5/9	56%	1/9	11%

		Unsatisfactory		Passing		Passable		Good		Excellent	
59. How would you evaluate the results you have reached in foreign language acquisition with your learning strategies?	Lang.	0/6	0%	1/6	17%	0/6	0%	2/6	33%	3/6	50%
	Mum.	1/7	14%	2/7	29%	1/7	14%	3/7	43%	0/7	0%
	Scien.	3/9	33%	1/9	11%	2/9	22%	3/9	33%	0/9	0%