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Pedagogical Tools and Methodology of Special Teaching Interventions for Specific Learning Difficulties [SLDS]

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Abstract: The purpose of this study focuses on pedagogical tools with emphasis on the methodology of special didactic intervention according to the Targeted Individual Structured didactically differentiated, integrative, pedagogical program of special education interventions TISDIPofSEIs for the students with Specific learning difficulties [SLDS]. Our literature study examines the reading, writing and spelling skills of people with learning disabilities with hetero observations and informal pedagogical assessment. Those recorded as significantly lower than the expected level and average of the class and supported by the pedagogical methodology of special teaching interventions. Because the insufficient development of individual language skills combined with the difficulty of handling abstract concepts and the inability to organize ideas and knowledge in memory, make oral and written expression a particularly demanding and difficult task for students of all ages with learning difficulties. In conclusion, with the pedagogical tools according the methodology of special didactic interventions students with SLDs support effectively who have difficulty making words, creating grammatically correct sentences, organizing paragraphs to compose a story, writing their thoughts and writing a text in logical order [1, p. 273].

Keywords: Pedagogical Tools, Methodology of Special Teaching Intervention, Learning Difficulties.

INTRODUCTION

Learning disabilities are an area of special education that has been much studied by humanities researchers. The reason why the scientific community has focused so much on this kind of special need is the "paradoxical" difference observed between children's high or moderate mental capacity and their low school success. People with learning disabilities do not respond effectively to various areas of learning, despite their intelligence adequacy [2, p. Vol, A, p.259]. In other words, students do not manage to cope with school practice activities to the same extent as their peers, even though they follow the same conventional teaching schedule.

Various definitions have been formulated from time to time to identify the specific disability. The diagnostic manual International Classification of Diseases - 10 (World Health Organization, 2011) [3], recognizes learning disabilities as "specific developmental disorders of school abilities" and defines them as "groups of disorders manifested by specific and significant deficiencies in the learning of school skills, which are not the direct consequence of other disorders although they may coexist with such conditions". The term "learning disabilities" was first used by Samuel Kirk in 1962. According to Kirk [4], it is "a delay or disruption of development in one or more functions of written and spoken language. Difficulties in reading, writing, spelling, comprehension, but also in mathematics occur due to some possible

brain dysfunction or certain disorders in executive functions influenced by negative cultural and social factors" [5, p. 331]. The 1977 U.S. Federal Census Inventory included the following definition: "A learning disability is a disorder in one or more of the basic psychological processes involved in the use of spoken or written language that may occur due to the inability to follow a speech, to think, or to speak, read, write, spell or do mathematical calculations". In 1988 the U.S. Joint Committee on Learning Disabilities gave a more comprehensive and, for many researchers, more acceptable definition of learning disabilities: "Learning disabilities is a general term which refers to a heterogeneous group of disorders, the general characteristics of which are significant difficulties in acquiring and using listening skills, speaking, reading, writing, reasoning or mathematical thinking. These disorders are inherent in the individual, are attributed to dysfunction of the central nervous system and can occur throughout his life." In 1996, the special education team [7] of the Greek Pedagogical Institute, consisting of Drossinou, Markakis, and Christakis, described learning difficulties as follows: "Language and math learning disabilities in children who do not have mental retardation problems are due to imperfect perceptual brain functions, which affect the coding and decoding of stimuli and are presented as disorders of thinking, speaking, reading, writing, spelling, reading comprehension and numerical thinking. According to Christakis, they are found with the term's "dyslexia", "dysgraphia", "dys spelling", "dys legibility" and "dyscalculia" [2, p. 261, 8, p. 321-350]

The pedagogical tools and methodology of special didactic interventions for learning disabilities claim that the term learning difficulties describes a heterogeneous group of difficulties [8, 9, 10, 11, 12], which constitute subgroups. They also consider learning difficulties inherent in the individual, which implies their manifestation not only during the school years but also during the person's experience in the other aspects of his adult life. Finally, they recognize the dysfunction of the central nervous system as the main cause of learning difficulties [14] [5] [15].

The educational tools and pedagogical methodologies are described according the Special Education and Training [SET] [16] [17] and propose for the education of children and young people with specific learning difficulties through the differentiated plan for building a targeted teaching program TISIPfSEN [18, p. 473-541]. This highlights the targeted, individual, structured, inclusive special education intervention programs [9] (TISDIPofSEIs). The special teaching methodology with the Targeted Individually Structured Didactic Integration Programs of Special and Education Interventions (TISDIPofSEIs) is using as a portfolio in five phases including the observation methodology of people with SLDs [20, p. 175-184, 21, pp. 383-463]. Systematic empirical observation [21, p. 219-271] is one of the research methods [22] in Special Education, utilized according to Theory and Pedagogical Applications [23] [24] [26, 27]. The teacher collects data through the participatory teaching process in the classroom and refers to individual, family, school history and the individual's diagnosis and intervention. Nowadays, significant changes

have taken place in social reality, resulting in strong individual, cultural, linguistic, social, economic and religious differentiation in the student population. Based on these conditions of marked differentiation of students [23], the existence of an average typical student and therefore a single teaching aimed at him proves theoretically inaccessible and practically ineffective. The promotion of the integration of students with SLDs by applying the pedagogical tool TISDIPofSEIs in general classes contributes to this problem, which significantly expands the meaning for differentiation.

Pedagogical Tools And Aetiology Of Learning Difficulties

The methodology of special didactic interventions for specific learning difficulties [SLDs] approaches the issues of aetiology of learning disabilities according to the literature research of special education. The diagnostic manual International Classification of Diseases [3] although the aetiology of learning disabilities is still unknown [12] for the most part, their manifestation is attributed to biological factors, which interact with non-biological factors [3]. In their effort to clearly determine the cause of learning disabilities, researchers have looked at biological and environmental causes. Due to the different scientific background of the two approaches, various and often conflicting theories were formulated for the interpretation of learning difficulties that were formulated without the use of pedagogical tools such as TISDIPofSEIS –[SLDs], (see Figure 1).



Figure 1. Special education interventions and pedagogical tools.

According to the biological approach [29], the main cause of expression of learning difficulties is the dysfunction of the central nervous system [30]. Although the exact nature of brain dysfunction has not been identified, it is likely that it is the result of either hereditary factors or other causes affecting the individual during the prenatal or genital period. Christakis in his book "*The Education of Children with Difficulties*" [2], (Christakis, 2000, p. 175-266) [32] states that pedagogical tools such as TISDIPofSEIs with emphasis the [SLDs] are applied up to fifteen minutes at a time with a specific methodology of special teaching intervention. Other researchers, such as [9] [10], argue that hormonal abnormalities are the cause of learning disabilities. Scientists who embrace the biological approach as a cause of expression of Attention Deficit and or Hyperkinetic Disorder [ADHD] [33], focus their attention on the "risks" to which individuals

have been exposed prenatally or postnatally (Porpodas, 2003, p.334). Researchers [34], [35] emphasize that prenatal effects are related to fetal development as a whole. By extension, they affect the development of his brain and the functioning of the central nervous system. Among the prenatal factors that are considered responsible for a child's learning difficulties are the advanced age of the mother, her health problems, her poor or deficient diet and their exposure to teratogens (drugs, alcohol, tobacco). Sometimes learning disabilities are the result of factors at birth. Premature or late birth, low birth weight, poorly developed nervous system, delayed oxygenation and birth injuries are some of the genetic causes of learning difficulties [36, p. 335, 5].

Also, according to Porpodas [12] learning difficulties may be due to environmental factors and specifically to problems of the family and school context, the burdened natural environment and the improper nutrition of the child. He argues that an inhospitable hostile, violent family, school or physical environment can cause difficulties in acquiring knowledge [37, 38]. Among the reasons for the existence of an adverse family context include the lack of one parent, the authoritarian way of upbringing, the absence of parental mediation, the lack of organization, regulations and motivation, the limited educational level of parents, the lack of adequate stimuli and the existence of psychopathology. Similarly, negative school experiences can be an important - albeit secondary - factor in the manifestation of learning difficulties. Many times, students who for any reason are "late in starting" the learning process, they are "always behind" compared to the rest of their classmates [20]. It is possible that students have no history of central nervous system dysfunction but are characterized by low levels of school readiness [7]. The learning readiness reflects how well the child has been prepared "to acquire knowledge and skills and to form attitudes that will help him adapt seamlessly to the school environment and successfully meet the requirements of the curriculum" [39]. According to the pedagogical methodology, observations in neurodevelopmental areas are recorded with particular Basic Skills Checklists in tabular. These empirical hetero-observations check the low levels of learning readiness' skills and show down students' learning performance from their very first individual educational interventions who has accepted from the nursery. In addition to the problems in the family and school context manifested by school and family violence, researches [39] [37] argue that extreme climate changes occurring in the natural environment may be a factor in the manifestation of learning difficulties. The extreme changes in the environment, the high temperatures, the environmental pollution and especially exposure to lead both during the prenatal and postnatal period, are factors which affects concentration of attention, the use of his spoken language and comprehension. When it is accompanied by stress from the lack of food or the unilateral eating is another aggravating factors for the learning and behavior problems [40] [37] and produce negatively emotions to the students.

The Informal Pedagogical Assessment And The Observational Pedagogical Tool For All The Types Of [SLDS].

The pedagogical tool of informal pedagogical assessment [IPA] is using according to the methodology of observation the [SLDs] according the second phase of TISDIPofSEIs. These demonstrate in a unique way to understand the capabilities and difficulties of individuals with SENs, also, show their talents and interests, presenting uneven levels in the neurodevelopment areas of learning readiness (see, figure, 2). These disparities and types of learning difficulties are assessed with standard assessment with weighted psychotechnical tools [29]. The informal pedagogical assessment is based on the methodology of hetero-observations and provides important information about the emerging skills for personalized educational program TISDIPSET. The personalization of the daily schedule, work system, activities and materials are essential because it relies on the possibilities, difficulties, interests and characteristics of SEN learners, using visual and auditory conceptual facilitators.

The informal pedagogical assessment with the pedagogical tool TISDIPSET -SLDs is used in the action and teaching research with the purpose to understand this heterogeneous group of disorders around the acquisition of school and university skills (Christakis, 2000) [41]. Learning problems related to the acquisition of various academic skills which are found in the literature under the term "general learning difficulties" or "learning difficulties". The Diagnostic and Statistical Manual of Mental Disorders [29] distinguishes four types of learning disabilities. Three of them are specific learning difficulties (reading disorder, mathematics disorder and written expression disorder) while the fourth concerns generalized learning difficulties and is characterized as "learning disorders not otherwise specified". SLDs are related to the processing of the written word and have an organic basis. In Greek bibliography, the group of "specific learning disorders" includes dyslexia, dysgraphia, dys-spelling as dys- orthographia and dyscalculia [8], [12].



Figure 2. Pedagogical tools and the informal pedagogical assessment of learning difficulties

The IPA is a part of a linkage of tools under the pedagogical tool' umbrella the TISDIPSET -SLDs, which it helps the teachers to understand the specific learning disability in reading is known as "dyslexia" and ''ADHD'' [42] [33]. In 1989 the British Dyslexia Society defined dyslexia as "a specific difficulty in learning in more than one or all of your reading, spelling and writing skills, which may also be accompanied by difficulty with numbers" [42]. According

Porpodas [5] [36] [12], "Dyslexia is due to a fundamental dysfunction of innate learning mechanisms". Researchers [11], [9], [43], [15] distinguish two types of dyslexia, depending on the type of innate learning mechanisms that are underactive: visual dyslexia (when there is impaired visual function) and auditory dyslexia (when it comes to a defect of auditory function]. Also, learning difficulty with specific characteristics is not always and one-dimensionally identified with

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specific reading difficulties (Christakis, 2000) [44]. A student may have general reading difficulties without having dyslexia. Such an example is students with difficulties in phonological awareness. The performance of these students in reading texts is significantly difficult, but they cannot be characterized as students with dyslexia [12] [13] [11]. The barriers of dyslexic students encounter in decoding words include: difficulty distinguishing different words containing the same letters, inability to pronounce unusual words, incorrect pronunciation of vowels, "mirror reading" (e.g. "other" instead of "all"), insertion of irrelevant phonemes in reading, and replacement of one word by another with a similar meaning (e.g. "bright" instead of "shiny"). The difficulties of dyslexic students in writing are mainly related to the incorrect orientation of letters (e.g. 3 instead of in greek letters "\epsilon") and to the inability to distinguish between letters that "resemble" each other (e.g. in greek letters '' θ and β ''). Students in the universities' writing is characterized by incomplete alignment of words on paper, imprinting illegible words or letters and words written "mirrors", use of capital letters between small letters, omissions, repetitions and transpositions of letters that constitute a word [38] [25] [45]. In spelling, dyslexic students make many different mistakes each time in the same words.

The Pedagogical Methodology Tools For Specific Didactic Intervention.

Others pedagogical tools are using according to the methodology of interventions for the [SLDs] and the fourth and fifth phase of TIS-[D]- IPofSET-SLDs. The letter [D] of the acronymous demonstrate the structured didactic differentiations for learning difficulties, such as the specific learning disability in writing "dysgraphia", "dys-orthographia" which are defined between the priorities of teaching program and curriculums [20, pp. 175-184, 40, pp. 127-172] [48, pp. 127-172]. According to Christakis [20, p. 175-184] it is "first of all writing with poor appearance". The specific learning disability of dysgraphia is a functional abnormality due to neurological dysfunction and specifically to impairment of visualmotor coordination [9] [11]. The symptomatology of the disorder includes replacements and reversals of letters with similar voices. Other characteristics of dysgraphia are the very slow pace of writing, omissions or additions of letters, the absence of accents or intonation of words, the course of writing words and sentences from right to left, the lack of boundaries between words and the inability of the child to write in a straight line [24] [32] [47]. Students with dysgraphia also face some difficulties that do not manifest themselves immediately. Such problems are the difficulty of connecting words and sentences, the inability to structure a story, the inability to write a text in a logical order, etc. Usually, the student with dysgraphia or dyslexia faces problems in the spelling of words. However, there are cases of children who are keen readers but unamenable spellers. When the difficulties faced by the individual concern only the possibility of spelling, they are described with the term "dys-spelling". A person who does not correctly render written representations of words, changes the order of the letters that compose them, does not mark sounds with the corresponding phonemes or clusters of letters, adds, omits and transposes graphs. According to the researchers [48] [49] [36] learning spelling is done through the compilation of a "visual dictionary" in memory, which is acquired photographically from the moment the child is exposed to the written word and then enhanced by learning the rules of grammar. spelling when writing words. Their spontaneous writing results in them making mistakes in even the simplest words and endings, even if they know the relevant rules of grammar.

Furthermore, the teachers design and apply the pedagogical tools according to the fourth phase of TISDIPofSET-SLDs following the criteria for structured didactic differentiations to face the learning difficulties. The interventions in these cases do not focus on a specific

cognitive domain but on the school performance of the students as a whole. For this reason, the pedagogical tools are not addressed to "specific learning difficulties" but take care of all areas of the pedagogical practice. According the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013), "learning disorder not otherwise specified" defined as the category of school disorders that includes problems in the three areas (a) reading, [b] mathematics and [c] written expression. Which together significantly hinder school performance even if the performances on tests measuring each individual skill is not significantly lower than as expected. Thus, students with generalized learning difficulties have, most of the time, problems related to reading, comprehension, writing, spelling and mathematical thinking. The academic weaknesses of children who have not been diagnosed with a "special" school dysfunction manifest as a result of their general learning difficulties. In other words, students's problems in acquiring individual cognitive areas (e.g. reading, writing, etc.) are expected and are due to the general difficulties which they present in learning. Porpodas [12] argues that the existence of general learning difficulties outlines the academic profile of students by indicating various characteristics regarding students' cognitive development and their performance in academical subjects. However, it should be emphasized that when referring to the characteristics of students with learning difficulties, the pedagogical tools describe a list of rough elements that are simple indications of the developmental and cognitive profile of students. The individual differences and the heterogeneity of the particular needs of students (even those diagnosed with the same learning difficulty) have imposed the study of each case and the individualized provision of all possible assistance.

Concluding Proposals For The Pedagogical Methodology Tools Of A Specific Didactic Intervention For Learning Difficulties.

Our main conclusion is that students with SLDs have difficulties in writing expression. The formulation of ideas through written expression is one of the most demanding aspects of language ability since it "reflects the individual's ability to listen, speak, read, write, spell, remember and think" [12]. Lately they use applications with certain artificial intelligence platforms, where with a certain subject and keywords, the text is automatically displayed with machine learning [26]. Therefore, the first concluding proposal on the pedagogical methodology tool addresses the problems in the development of cognitive skills, which takes place through learning. They are supporting in a targeted way with multisensory learning readiness activities emphasize the skills of perception, attention, thinking, memory and use of language through the pedagogical relationship. Perception, attention and memory problems are also cognitive characteristics of students with learning difficulties and are due to neurological dysfunctions [42] [8]. Individuals usually have difficulty with skills related to perceptual functions, such as spatial orientation, visual discrimination and processing, visual memory, auditory memory, recall of a sequence of sounds or spoken instructions, auditory discrimination and perception of sounds

According to the pedagogical view of individuality and the letter [I] of acronymous T-[I]-SDIPofSET-SLDs follow the criteria as the mental capacity which is manifested through the inability to respond at a certain time. The difficulty of understanding texts presupposes that neurological executive functions evolve within a certain and required time to decode and encode data. Inclusive time in the pedagogical methodology of a special teaching intervention is given meaning by the time allocated in the weekly curriculum attended at school. The difficulty of understanding time is suggested by the pedagogical methodology of special didactic intervention with differentiated materials and means such as the binder with fixed and mobile cards and its applications on smartphones.

The second concluding proposal on the pedagogical methodology of a special didactic intervention for learning disabilities as stated by the letter [P] of acronymous TISDI-[P] of SET-SLDs follow the criteria which related to memory skills. Memory is characterized as particularly poor, with individual difficulties in the operation of shortterm, long-term and working memory. Concentration, attention and limited time range are perhaps the most distinct difficulties for people with learning disabilities. These include inability to concentrate, attention deficit, divided attention and poorly developed selective attention [38] [33] [43]. Problems in the above aspects of cognitive skills result in problems in learning school skills that require the proper functioning of neuropsychological characteristics. People with memory difficulties often have problems learning to read, write, spell and math, have difficulty completing academical work [52], low energy when dealing with school lessons and easy distraction from irrelevant stimuli [50] [36].

In inclusive education, as indicated by the initial letters [I] of acronymous TISD-[I]-P of S-[E]-T-SLDs follow the criteria which related to address language difficulties as the understanding, namely syntax, phonology, morphology, semantics and referential communication. With others words this point argues that the inability to syntax the language results in the creation of short phrases of oral comprehension by students, with a structure much simpler than expected for their age. Problems in the phonology of language lead students to eliminate consonants or replace them with others, not distinguish phonemes or pronounce them with poor sound quality, The researcher points out that students' difficulties in the morphology of language do not allow the correct rendering of meanings that are reflected with small morphological and orthographic differences. Problems in semantics Language is related to the meaning of a word in relation to the other words in a sentence. Students with learning disabilities perceive use fewer words than their peers. Their written text is structured with stereotyped expressions that have been indirectly imposed by the television environment [25] [32] [17]. They often choose words that do not match the meaning of the sentence and very rarely use expressions with abstract content. Their narrative presents additional problems due to the students' difficulty in prioritizing information and logically linking cause-and-effect relationships. Finally, the difficulties faced by students in utilizing *referential* language communication are manifested through the inability to understand the received messages and instructions given to them by teachers and through the inability to transmit information to other people. Problems with oral pronunciation of language are a factor that makes it even more difficult for students to acquire knowledge.

The third concluding proposal on the pedagogical methodology tools of special teaching intervention for students with learning difficulties who usually present problems in all aspects of language lessons and terminus. Their difficulties appear as an inability to complete tasks at a specific time, as a difficulty holding rules, letters and syllables in memory, and as an inability to use the appropriate words each time. The reading performance of students with learning disabilities is significantly lower than expected, given the chronological age of the individual, intelligence and education corresponding to their age. The pedagogical view of differentiated and structured teaching proposes multisensory learning readiness activities with cards that teach students to make choices with distinctions between letters and correspondences with the correct phonemes with graphs. As a result, students find it difficult or unable to understand and - much less narrate the content of what they have read. Such reading difficulties are likely to burden student's progress in other subjects whose learning requires reading texts in subjects such as history, geography. The pedagogical methodology tools in writing intervention difficulties is another conclusive proposal for students who have incomplete knowledge of the alphabet, inability to distinguish between letters, incorrect phoneme-graph correspondence and difficulty remembering syllables (Christakis, 2000) [51]. This is a complex language skill that is difficult to master, and usually students who read with difficulty show poor or limited performance in spelling even if they have adequately developed the more difficult cognitive functions required for spelling.

ACRONYMS

-[1]Targeted Individually Structured Didactic Integration Programs of Special Education Interventions (TISDIPofSEIs) -[2] Specific Learning Difficulties [SLDs] -[3] Attention Deficit and or Hyperkinetic Disorder [ADHD]-[4] Special Education and Training [SET] -[5] Targeted Individually Structured Didactic Integration Programs of Special Education and Training (TISDIPSET)

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