

COLLABORATIVE LEARNING AND CONCEPT MAPS, IMPLICATIONS FOR DEVELOPMENTAL DYSLEXIC LEARNERS

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Abstract. Learning difficulties concept is frequently used in Venezuelan educational levels to describe a wide variety of characteristics that could obey to student individual differences. Undiagnosed bright dyslexic students stay behind in various levels of educational system. They pass unattended, tagged as lazy or dumb, without the special care that defines this group of students, and never arrive to Special Education attention. Qualitative research goal is to understand the singular characteristics of the psycho - educational and family factors that contributed to the successful evolution of one developmental dyslexic case; establish patterns in 8 similar cases; design and implement educational intervention that benefits a group of dyslexics in an integrated classroom. Literature revision is centered in dyslexia, its etiology, diagnosis, process and educational strategies of attention. Results show the reconstruction of protective and risk psycho – educational and family factors that lead to success and school intervention characteristics. The results show that instruction centered in cooperative and collaborative learning enhance social skills; concept mapping oriented towards expansion of semantic networks, definition of relationship between concepts and hierarchic construction, challenge knowledge, contribute to enhance vocabulary and word retrieval and allow expression of complex ideas. These are desirable skills for dyslexics, who benefit from educational intervention, as well as non dyslexic.

1 Introduction

This article shows particular trend in learning for people with dyslexia -a specific learning disability that impair many students to express their thoughts by writing and acquire knowledge by reading- and develops how concept mapping and collaborative learning build strengths in their learning process.

Constructing semantic networks that contribute to build paths to word retention and word retrieval that are prominent weaknesses in dyslexia; understanding and promoting valid and logical relationships between semantic webs and promoting social skills where dyslexic use their strengths to enhance these networks, concept maps and collaborative learning are the best ways to learn. If learning for the dyslexic is a process of enhancing academic skills that may be deteriorated by written or reading expression, a graphic way to express new ideas centered in logic organization –one of many strengths in dyslexia- should be an adequate way to communicate learning experiences, and according to the functions of concept maps, a way to learn. If concept maps are effective tools to build semantic networks in a logical way, and logic and social skills are strengths in dyslexics, a program based in concept mapping and collaborative learning should optimize learning outcomes. Dyslexic skills can be strengthened by concept mapping, especially for the reason of promoting hierarchic relations through meaningful connections. Associated with this tool, concept mapping allows dyslexic extraordinary ability of parallel thinking to flourish and contribute to express their outcomes in collaboration without relying in writing expression.

2 The Research

Currently Venezuelan children with notable differences in their learning processes coexist in the classrooms, sharing the same routines, programs and curricular activities, treated with a degree of uniformity, disregarding their differences. Teaching experience points to the idea that bright students, able to get the best academic results, share the same system of those diagnosed with dyslexia, learning disabilities, or both, and apply patterns that could be effective for some and deepen differences in others. Thus, there is concern on alternatives that protect and empower those whose cognitive strengths do not focus on traditional developed and evaluated skills in school. Hence stems the study of new educational approaches that focus on the concept of intelligence as multiple potentials, develop differential strengths and not only those who excel in Language and Mathematic areas.

The first experience was the search of alternative explanation to understand the development of a case diagnosed with visual and auditory dyslexia at 8 years old, who grows to have a Master degree in Mathematics with control of two languages at the age of 24, (Acedo, 2004) Elements that allowed resiliency formation - human beings capacity to transform their risk factors in protective factors for development- (Maddaleno, 2000, Krauskopf, 2003) are pointed out and verified in 8 similar cases. Once this process is described, regarding its main characteristic, a series of actions that lead to learning are designed based on teaching strategies that could benefit both, students with similar problems as those who show no evidence of problems or whose results are outstanding. Strategies are explored for the purposes of establishing their relevance to produce specific learning

outcomes in classroom context, under a scheme of action research, in a group of last year of Diversified Medium Education level, in a subject matter specially designed for the purpose of filling the cultural references and educational cognitive needs detected in students who begin their university studies.

Educational intervention takes place with an instructional design that incorporates the factors that made up resilience in the case studied, especially cooperative learning, collaborative learning and concept mapping. This design is implemented in a private integrated classroom with two dyslexic students and four undiagnosed, but suspected to be dyslexic. The number of students is 17, ages 16 to 18.

Goals of the study were:

- Identify areas favoring successful development of a case diagnosed with developmental dyslexia related to resiliency.
- Design a set of teaching strategies that promote resilience formation in students with learning difficulties and to implement them in a school group with integrated classrooms.
- Explore teaching strategies that promote learning as a way to be resilient and determine benefits in students with and without learning difficulties.
- Proposing a line of beneficial teaching strategies for students with learning disabilities.

3 Discussion

Dyslexia needs special instruction, due to the difficulty not only in reading or writing, but understanding. Instruction should be individual and adequate to learning styles (Pujol, 2003; Alonso, Gallegos & Honey, 1997). When inquiring about learning styles in successful dyslexics with the same diagnosis and treatment as the first case studied, they become compensated which is coincident, in time, with expertise in learning. This indicates that there is plasticity in dyslexia, toward the learning process. Therefore the condition might be changing the way to learn, due to instruction. In fact, if there was no special instruction in these successful dyslexic students, and they were able to compensate their way of learning in order to achieve this success, then, teaching should promote this compensation through proper instruction.

Social skills are key in dyslexics and were commonly found in the cases studied. Shaywitz (2003) has described dyslexics as sensible children that understand many sides of the same problem. They are capable of being empathic with others points of view, regardless the complexity of the position. This is a suggestion of parallel and complex thinking in spite of their poor reading, writing and comprehension skills, which constitutes a paradox in the sense that how can somebody have comprehension difficulties and, at the same time being able to understand complex situations and being able to mediate between them? This paradox is their way of thinking. Competent dyslexic have this in common: once they find the path to understanding, they are capable of exceeding what is expected with knowledge. Therefore teaching is about helping to bridge, finding pathways, building scaffolding useful to link concepts, actions, procedures, principles. Since there is very limited appropriation of the reading process and, at the same time, limited comprehension, especially oral interpretation is needed. If they explain, they will learn. Instead, if they have to read or write, failure appears.

As previously stated, the main difficulty in dyslexia is communication. A dyslexic person has tremendous difficulties retrieving adequate vocabulary for expressing ideas, extracting meaning from reading, producing writing to express ideas and, finally, due to this difficulty with words, comprehension. Therefore instruction should promote these trends to facilitate communication. Communication process, especially of academic matters should not be isolated from social skills, where dyslexics are strong. These social skills are beneficiary for communication and dyslexics have much strength related to them, such as being able to understand many sides of the same problem, when properly oriented. In addition, dyslexics can easily understand modeling and how simple procedures can be applied in many situations. Concept mapping is an excellent tool to build these modeling not only because it enhances vocabulary in semantic networks, but also they force the student to build a definition of the tasks that represent linking between concepts.

Concept mapping in dyslexic students contribute to motivation to learn and challenge to create relations between concepts. Due to word recognition and retrieval difficulty, since concept mapping is oriented to symbols more than words, they benefits dyslexics: Organizing information in a logic and hierarch way are characteristics of concept maps and strengths in dyslexia. Concept mapping will rely then in dyslexic strengths. Even though other graphics such as Venn Diagrams, cause effect diagrams, and others, are useful tools, the student is not asked to think of the nature of the relationships established between concepts. Just and in a simple way, students are asked to place information in one side of the graphic or the other. The problem with this

instruction is that it does not produce the expected learning when there is no analysis of the nature of the associations. In a way, concept mapping forces the student to analyze the nature of relations and when they do, learning outcomes are richer and more accurate.

When expressing ideas, substituting reading with sharing symbols that can obey to the meaning of a given word, phrases or more complex sentences, typical in concept mapping, learning can be expressed and understood by others if they had negotiated these meanings. Thus, not only communication process is promoted, but communication for dyslexics. In this sense, diagnosis of previous knowledge, following construction of new knowledge and being able to formative assessment of students work is an outcome when using concept maps. For the most impaired, substituting writing with graphic organizers, especially concept maps, and oral communication is the best way for diagnosis and evaluation of their knowledge and school progress not taking in account their limitations or disabilities. This process can even substitute writing process for the most impaired and help these students, who are bright and socially able, to live a full productive life, to cope with school requirements without reading and writing skills and finally to express their exquisite thinking.. The power of making links or connecting concepts by mental processes that describe high thinking tasks, implies that the dyslexics and non dyslexics have a common ground where to express their construction of knowledge allowing these students to share meaning in a cooperative way in which non dyslexics benefit from dyslexic way of processing and producing knowledge, while dyslexics benefit from writing and reading skills of non dyslexic.

Online technologies such as *CmapTools* and other commercial firms that promote this hierarchic organization of new knowledge are adequate tools since they allow sharing meaning in learning environments. However, these tools need to increase their potential to organize features when building connections, guaranteeing that linking conditions are understood by all. For example, using maps to elaborate inclusions, cause effect, and other relations that can be explained by themselves, such as analyze, meaning dividing the whole in parts according to a criteria, may be explained and extend in depth in different levels but always the same procedure. Students should be able to point out the principle to analyze whereas the process by itself would be pointless without the proper specification of the limits of the higher thinking process that involves the task.

4 Conclusions.

Describing successful learning processes in dyslexia – first one case, verifying findings in 8 other subjects- followed by an active research to explore teaching strategies focused on generating resilience in a group of students; show that intervention was beneficial for both, students with learning disabilities and those who have never shown to have this kind of problems. This qualitative analysis is complemented with summative assessment analysis. Thus, in all evaluations applied, there was an increase in averages, while maintaining dispersion, compared to scores averages obtained prior to implementation. This evidence show that treatment is beneficial for both, more advanced and less advantaged students, since the extremes improved their grades in the same intensity. .

When analyzing retrospective learning process, dyslexic characteristics change over time. These changes are coincident with the maturation of learning processes. In fact, learning styles become compensated at the same time higher level thinking skills appear, such as autonomous learning, creative thinking or decision taking takes place. This could be evidence of plasticity of the dyslexic learning condition when is affected by learning process, meaning it changes and is moldable when learning occurs. In this sense, concept maps are a way of monitoring and diagnosing faults in this process, and allow meta-cognitive activity that allows to determine ways to control and improve cognition. Additionally, when teaching strategies focused on control of risk factors, they became protective factors, and when applied to the extensive group of students, they become desirable thinking skills. In fact, one of the outstanding achievements is that strategies oriented to holistic and non linear thinking are beneficial, both for regular students and those with difficulties.

It was also revealed the ability of students with dyslexia to provide creative solutions to problems. These outcomes became one of dyslexic most prominent advantages when cooperative and collaborative learning was assessed. To accomplish this, it was necessary to introduce principles of systematic critical and reflective thinking to ensure their autonomy. It is hoped, in the long term, that regular student apply the strategies that help dyslexic cognitive processing, since they increased their autonomy in critical and reflexive thinking, and contributed to recover their interest for certain academic subjects. Non dyslexic students, when understood dyslexic way of processing and producing information, due to the use of concept maps as mean of

communicating knowledge and meaning, changed their mental model based on reproductive and convergent learning, to be active participants in construction of knowledge. They replaced their reproductive practice for a productive learning community; differentiate essential content and associate it with new content to become strategic apprentices.

Finally, and as a primary purpose of the investigation, it is hoped that, through a deliberate pedagogical action that include collaborative learning and concept mapping, students with learning disabilities, specifically dyslexia, transform their risk factors into protectors, in regard to their learning abilities. This approach allows to confirm the assertions of Eden and Lyon exposed as findings in the context of VI International Dyslexia Conference, organized by the British Dyslexia Association (BDA) that what is good for dyslexia is, is good for all students. Furthermore, any diagnosis or intervention in dyslexia must be preceded by an adequate educational practice.

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