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Geography and disability: a reflection on opportunities offered by teaching geography to dyslexic students

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Abstract

Thanks to the enactment of Law 170/2010, in Italy teachers are required to adopt forms of teaching that differ significantly from the "traditional model" for students with dyslexia. A consideration on disability is an opportunity to reflect on the teaching of geographic skills, which consists mainly in the search for strategies that can facilitate the learning process of the students, even for people with learning difficulties. Geography becomes the discipline that can meet the needs of students with learning disabilities and which has great potential for teaching, because by means of values training and the organization of knowledge characterizing it, they can emphasize and highlight the processing of information that takes place on the basis of the person's cognitive style.

Keywords: Dyslexia, Learning Disability, Cognitive Style, Active Learners, Geography Workshop, Bridge Discipline

1. The law on Dyslexia in Italy

Dyslexia affects the area of the brain that deals with language, leading to differences in the way information is processed and affecting the underlying skills needed for learning to read, write and spell.

Dyslexic students can often perform a range of complex tasks, such as solving complicated problems in electronics or design, yet they cannot do seemingly simple tasks: learning to read and spell, organizing writing, taking notes, remembering instructions, telling the time or finding their way around. This pattern of strengths and weaknesses can be regarded as a cognitive or learning style. In fact, many dyslexic students themselves experience their dyslexia as a difference in the way they think or learn, even related to the place where they were born.

In fact, when talking about dyslexia one must always keep in mind that neurobiological difficulties can affect the ability to read and write of any person in the world, no matter what their language might be. It is also true, nevertheless, that it does not affect all of them in the same way, but has a degree of influence which varies depending on the specific characteristics of each language.

Italian, for example, is a transparent spelling language, which means that the correspondence phoneme-grapheme is direct, and consequently words are read as they are written. Italian speaking children, although dyslexic, will always have fewer difficulties than their Anglophone peers, given the strong correlation that directly links graphemes and phonemes in Italian words. When, however, they have to learn other languages, as in the case of English which is now taught as early as the first year of school, they too will be unable to read without making mistakes, thus compromising their understanding.

The reason is therefore clear why the incidence of dyslexia in English speaking countries is much higher than in Italy. If in our country, in fact, cases of reading disorder are around 3% and 5% of the school population, in the US, according to the International Dyslexia Association, these percentages quadruple and even reach 15-20% .

In Italy, thanks to the enactment of the law on Dyslexia (law 170/2010), students with reading disabilities have acquired the right to take part in school life as active learners, without having to face the difficulties that made their studies fraught and arduous. Today, according to the new legislation, through remedial work, formal intervention and support measures students can give their best while dealing with their special needs.

The Law on Dyslexia is the result of a 13 year struggle led by the AID association (Italian Dyslexia Association) with the cooperation of parents, dyslexic adults, teachers and technicians of the Association. It is relevant to point out that the Italian acronym DSA, which stands for Specific Learning. Disorder, focuses on a condition that seems to be more related to a body impairment, whereas the English acronym LD, Learning Disability, refers to a social perspective.

Moreover, the term "Disorder" is one of the first formulations (Critchley, 1968), introducing the criterion of "difference" between IQ and academic skills, whereas the term "disability" highlights the ethical goal of social care dealing with the right to have equal opportunities in the field of Education. The word "disability" is strictly related to a social condition and has nothing to do with a subjective condition of the person.

More precisely, a learning disability is a classification that includes several areas of functioning in which a person has difficulty in learning in a typical manner, usually caused by unknown factors. While *learning difficulty, learning disorder* and *learning disability* are often used interchangeably, they differ in many ways. These problems, however, are not enough to warrant an official diagnosis. Learning disability on the other hand, is an official clinical diagnosis, whereby the individual meets certain criteria, as determined by a professional (psychologist, paediatrician, etc.). The difference lies in the degree, frequency, and intensity of reported symptoms and problems, and thus the two should not be confused. Types of learning disorders include reading (dyslexia), writing and mathematics (dysgraphia and dyscalculia).

2. Dyslexia: a learning difference

According to the social model of individual differences**,** difficulties depend mainly on the culture in which we live. In fact, in an oral culture, dyslexics do not manifest themselves, since they would not be required to write and read (Pollak, 2009).

In the interactive social model, dyslexia is considered a learning difference, because every human being is "neurodifferent": we can say that it is the social context that determines whether the neurodiversity is perceived as disability or not.

Moreover, difficulties can be neutralized by exploiting potentialities (leveraging on the strengths) emerging from a person with DSA (Stella and Grandi, 2011):

- intelligence;
- ability to store images;
- unusual approach to school subjects;
- ability to make unconventional connections;
- creativity and ability to produce new ideas;
- propensity to the selection of topics in a discussion;

- skill in the problem solving strategy that requires you to imagine possible solutions.

Many of these above mentioned characteristics are associated with the ability to process information in a global way, rather than sequentially, and to think in a visual rather than verbal way (Morgan and Klein, 2000). This way of thinking is a characteristic of all children, even those who are dyslexic, since they tend to have a high level of divergent thinking, that allows them to find different solutions in a given situation (Land and Jarman, 1992). This feature generally remains stable – in children with DSA – into adulthood, so that *Fortune* magazine (Morris, 2002) connects the high percentage of top managers who are dyslexics with the very nature of the digital economy. In practice, the success of these managers becomes relevant because of their approach to solving problems despite their difficulties.

These results do not depend on a supposed therapy, but as a potential advantage in competitiveness resulting from the different nature of the new economy.

In the school educational field, the abilities that affect teaching and learning are: reading, spelling, writing and oral language.

Reading forms a major part of most curricular activities and if a student has, for instance, half the reading speed of other students, this may put an immense strain on his/her studies, affecting his/her ability to remember what has been read. Vocabulary levels may also be poor and so comprehension suffers.

Students with dyslexia may experience some or all of the following: visual stress, reading overload, lack of speed with reading, difficulty in summarizing, difficulty in sorting and selecting materials for study, a lack of understanding and retention of what has been read, difficulty in focusing on the main points of what has been read, misreading (assignment or examination questions) (Figure 1).

As regards spelling, dyslexic students can experience problems with written expression and vocabulary to such a point that it can affects a tutor's understanding of their work. The difficulties experienced by some students with dyslexia might include some or all of the following: difficulty in writing and listening simultaneously, difficulty in making detailed notes and understanding what has been written when reading it back, difficulty in focusing on the main points during lectures (note-taking).

Among others, problems occur when copying quickly and correctly and moreover students with dyslexia may experience problems with their written work including some or all of the following: poorly constructed form and slow handwriting interfering with their ability to get ideas down, difficulty in planning and structuring written work, problems with the transition of ideas, difficulty in relating theory to practice, poor written expression and/or sentence structure, difficulty in understanding writing conventions, difficulty in relating abstract to particular.

Certain difficulties, experienced by students with dyslexia, can be associated with language as well as written work and reading. Students may experience problems taking in orally given information quickly or accurately enough, understanding instructions or information, assimilating what has been said in a group situation, with word-finding problems or with pronunciation of polysyllabic words.

Some dyslexic students experience short-term memory problems which can affect note-taking, reading, writing and organisation but can also make it difficult for them to organize their time and meet deadlines. These difficulties tend to be the ones that are most often ignored and, because of this, dyslexic students can sometimes be judged as being lazy, unmotivated, sloppy or careless.

I would like to point out that many students with dyslexia are mathematically very able; however, some may have difficulties resulting from visual perceptual or short-term/working memory problems (Stella, 2000).

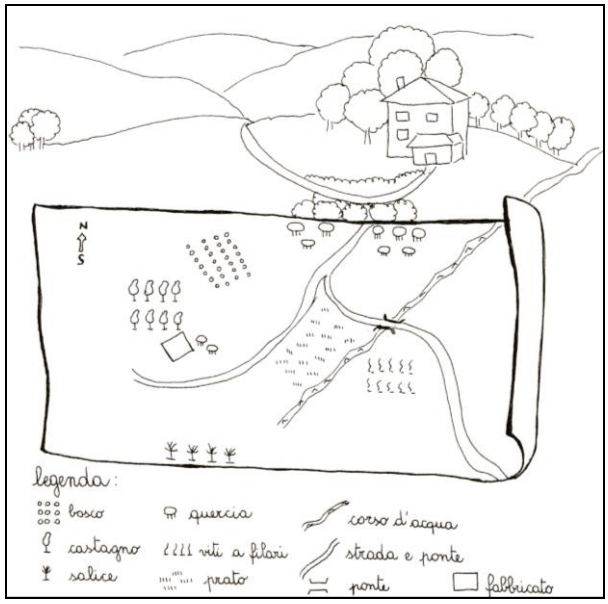

Figure 1. Students with dyslexia may have ability to construe images and read them in a symbolic form. Adopted and redrawn by R. Allegri, 2003.

3. Planning a project for a different mode of learning

Sometimes the difficulty may be associated with performing different tasks simultaneously e.g. listening to a speaker, taking notes and formulating responses (for some students performing these processes simultaneously is problematic). The development of this skill may be affected by a number of factors including dyslexia or dyscalculia which make it difficult for a student to extract the relevant information and organize it effectively**.**

One of the most useful tools for planning a project for children or teens with DSA is a personalized learning plan, or PDP (Piano Didattico Personalizzato). It is a document drawn up by the teachers for each student with DSA that contains the procedures to be taken to cope with the difficulties. The student will not be followed by the Teacher for Special Needs (not required by law), but by all his team-teachers.

This suggests that Law 170/2010 and the related Guidelines (2011) require that the school be compared with a different mode of learning.

The possible precautions are identified in compensatory instruments (Computer with word processing programs, concept maps and automatic audio players, calculators, tape recorders), in special attention (dispensation from reading aloud, by dictation, from the study of foreign language in writing) and the scheduling of more time to study at home and for the written tests or programmed oral verification.

The use of pictures, maps, symbols, building maps, charts, mind maps, drawings, facilitates learning and makes it more active.

But how to identify the difficulties?

As specifically regards the learning of geography, the difficulties can include the following: in multi-step problems, students frequently lose their way or omit sections, the retaining of various aspects of a problem in mind and combining them to achieve a final solution, sequencing complex instructions, and past/future events; slow reading, mis-reading or not understanding what has been read may also occur.

There are a number of instructional practices that can be used to help all geography students to develop their information processing skills, and these can be summarized as follows: encourage students to work with their peers for problem-solving activities. This helps them to bounce their ideas and helps to keep them focused on the task in hand without giving up. Students may need to focus more on the context of the problem in order to solve it, so they may need to be encouraged to seek out more background and supporting information, and highlight key words which help them to organize their thinking. It may help students if they are encouraged to colour code the stages of their problem solving.

This helps them to focus on the various stages of the problem and will also help tutors to see at what stage of the problem the student is experiencing difficulties. In addition to needing a calculator, students may find the use of a computer, as we have said before, useful to focus on the task without becoming too distracted; furthermore they can be encouraged to create a pocket book of facts and formulas that they can carry around with them to help them remember certain sequences.

Large multi-step problems may need to be broken down into smaller, more manageable steps: providing the student with flow diagrams

or tree diagrams for clarifying procedures can help the student to make sense of a problem. A successful strategy is to encourage students to use mind maps with extended pieces of work because they can help them to organise their thoughts (Waterfield, West and Chalkley, 2006) (Figure 2).

Today, the support of software like Power Point or Prezi to program homework, the presence in the classroom of a smartboard with instant access to several geobrowsers, make the lives of students with DSA easier as they are a dynamic means of reiteration. The advantages mainly concern interactivity, the use of multimedia resources: smartboards helps to marry listening and reading with the individual communicative power of images and video.

Another potential is processing auditory information: ensure that the overall discourse allows reiteration, clarification of new terms and regular pauses for reflection and to catch up, temper the overall speed of delivery, provide clear examples and explanations, supply handouts and explanatory lists of new concepts and unfamiliar terms.

In verbal communication it is necessary to learn to be multi-tasking (especially note taking), while learning strategies can: be aware of the difficulties posed by multi-sensory tasking, encourage students to audio record instructions and to audio record sessions (equipment may be funded through the DSAs, supplement verbal information with written or E-learning versions such as introductions, summaries and memory aids.

These reflections for processing information make the geographer consider how geography can "naturally" be a discipline meeting these characteristics of teaching needed by a DSA, even for its "dependence" on images, the *graficacy*, thanks to the ability to make unconventional connections typical of DSA students. For the propensity to the selection of topics in a discussion, one of the key themes of geography to understand is that human behaviour has positive or negative effects on a territorial system, because each one is an active part of the system and responsible for its operation and determines the knowledge of how the territorial system works: it is plain to see that we are dealing with a global approach to the analysis of reality, and this approach requires great capacity for abstraction. So geography becomes the discipline that aims to train world citizens to be aware, responsible and critical, enabling them to look at their environment creatively to make it more livable and to make decisions according to ethical environmental values.

It is therefore evident that the method can be treated as the content, since the strength of geography as a science is the way whereby we can study the territory. All aspects are in fact translated into teaching practice.

1. Proceed inductively, starting from the experience.
2. Use the deductive method in the verification of theoretical hypotheses.
3. Everything should be based on observation and collection of data should be related to facts and phenomena.
4. Compare data relating to facts and phenomena, to be able to understand causality (Allegri, 2007) (Figure 3).

4. Learning geography and its potential for dyslexic students

The formative values that characterize the discipline, can emphasize and highlight an information processing that takes place right on the basis of the cognitive style of the person (Stemberg, 1998). Cognitive styles relate to the choice of the cognitive strategies used to solve a task and should be evaluated as a preference in the use of their skills.

Moreover, if we consider that geographers should answer questions like: Where?, What?, How did it happen?, What are the implications produced?, How should it be handled in the context for the benefit of humanity and the natural environment? We can easily deduce that these questions can be regarded as a part of the different characteristics of the cognitive styles which can be preferred and strongly influenced by students with disabilities and their own styles: i.e. nonverbal and visual styles, global styles following the divergent way of thinking.

What kind of cognitive styles can a dyslexic student try according to the very nature of geography?

Global: approaching a text, a student with a global style focuses on the overall picture, looking at what is normally called the overview, and then examines the details later. In geography, the first activity of reading maps/cards requires an immediate global approach.

Analytical: the detail is perceived in a second phase and the following step of reading images comes after the first global approach, and it is helped by the *legenda*, that is a visual support guide to understanding. Even the *legenda* becomes a textual index suitable for the visual reading and the understanding of the overall message of the graphics or maps.

Visual: the visual style works through mental images, diagrams and graphic representations. The main tools of geography are graphs and thematic maps of different types that, in a global view, analyze the various issues considered.

Systematic/intuitive: systematic style sees the student proceeding in stages through the analysis of the different variables, whereas the intuitive style starts from a hypothesis and tries to confirm it. As for geography, both styles can be consistent in dealing with the various issues of geography.

These steps are also suitable for children attending the primary school, always bearing in mind that they focus their attention on what they see, that is, the objects that surround them, rather than on the content of what is said and thought about it (Allegri, 2003).

Unfortunately, the school continues to follow the general trend in transmitting a descriptive geographical knowledge, using the lessons as the only means of learning. This method is even more difficult for pupils with dyslexia and removes additional opportunities to the discipline instead of exploring new teaching and learning strategies.

The teaching of geography should tend to enhance the potential of students with dyslexia: the teacher's skills primarily consist in finding strategies that can facilitate students' learning process, even for those with learning disabilities. In order to plan effective instruction and intervention in reading comprehension, teachers must understand the array of abilities that contribute to reading comprehension and use assessments to help pinpoint students' weaknesses. For instance, a student with dyslexia, whose reading comprehension problems are associated mainly with poor decoding and dysfluent reading, will need different emphasis in intervention than will a student with poor comprehension due to weaknesses in vocabulary and oral comprehension. Teachers must be able to model and teach research-based comprehension strategies, such as summarization and the use of graphic organizers, and apply methods that promote reflective reading, metacognition, and student engagement. Oral comprehension and reading comprehension have a reciprocal relationship; effective oral comprehension facilitates reading comprehension, and wide reading contributes to the development of oral comprehension.

As stated above dyslexic people do not learn language skills subliminally, e.g. almost no dyslexic people can learn to spell correctly by copious reading. Often progress is made with a language skill when someone explains the skill in a way that makes sense to the dyslexic person. Without such explanations, comment and corrections about spelling, grammar, punctuation and syntax are futile: they add to the demoralization of the student; they provide the student with no information that s/he can use to improve future work, and they are a waste of the tutor's time.

The organizing of a geography classroom workshop with the cooperation of all students can be very useful, because it directly involves students in designing and promoting significant and active learning, based primarily on a visual approach, the ability to store images and an unusual approach to make unconventional, connections for the creativity and ability to produce new ideas and select the topics of discussion (Allegri, 2007).

Furthermore, the above mentioned divergent thinking can promote a new learning attitude towards the study of geography: the systematic study of functioning in a particular geographic area, leads us to understand that it can be perceived in the multiplicity and complexity of

its parts, without making abstraction processes that would alter the right view or observation.

Dyslexic students can also perform a variety of complex tasks, but cannot do the seemingly simple ones like learning organizing writing, taking notes, remembering instructions or readings that are difficult in length and vocabulary. One way to consider this model of strength and weakness is a cognitive style or learning and in fact many dyslexic students themselves experience their dyslexia as a difference in the way they think or learn, rather than as a disability.

Geography is also a frontier, a bridge discipline in the current debate, since we see two opposite views: the conventional view supporting a disjunctive logic way and a scientific approach to the subject, as opposed to an innovative position, showing the complex and multi-faceted nature of the discipline. The causes of these controversial and opposing debates are to be found in the identity, in the very nature of the discipline that results from the close relationship between environment and human beings and can be regarded as a science which cannot be considered either strictly natural, or distinctly humanistic.

We dare say geography is forced, by its own nature, to adapt itself to the changing natural phenomena. For this reason, geography as a discipline should be flexible, always updated and continuously self-redefining.

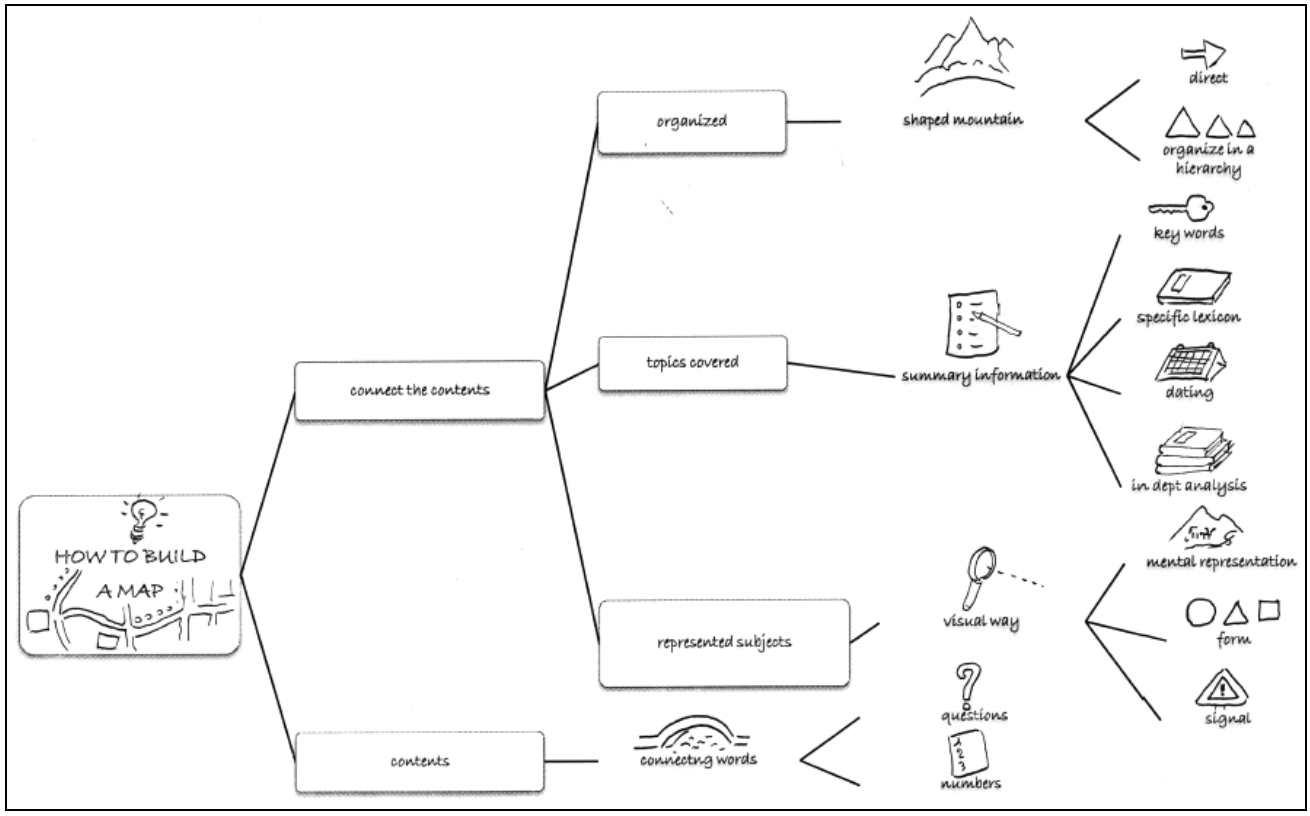

Figure 2. A good education for students with dyslexia is a good education for all: a method of study that focuses on different channels of access to information and an active and strategic approach to texts and contents. Drawn by R. Allegri.

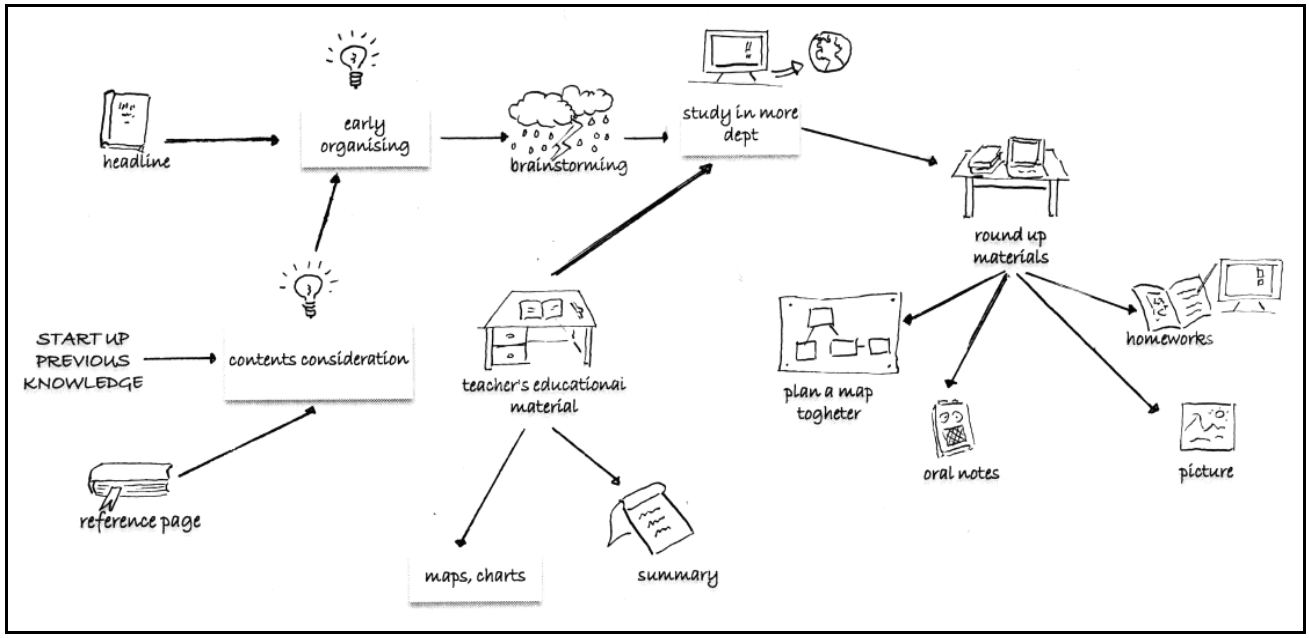

Figure 3. Phases of study in the classroom through various educational activities: the teacher's attention arouses interest in what the student knows how he reached that knowledge. Adopted and redrawn by Stella and Grandi, 2011.

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