Giornale Italiano di Educazione alla Salute, Sport e Didattica Inclusiva / Italian Journal of Health Education, Sports and Inclusive Didactics - Anno 6 n. 1- ISSN 2532-3296 ISBN 978-88-6022-436-1 - gennaio - marzo 2022 - CC BY-NC-ND 3.0 IT- https://doi.org/10.32043/gsd.v6i1.538

EVALUATION OF GRAPHO-MOTOR SKILLS IN DEVELOPMENTAL AGE: A PRELIMINARY STUDY FOR THE EXPERIMENTATION OF EFFECTIVE TOOLS IN THE DIDACTIC FIELD

VALUTAZIONE DELLE ABILITA' GRAFO-MOTORIE IN ETA' EVOLUTIVA: UNO STUDIO PRELIMINARE PER LA SPERIMENTAZIONE DI STRUMENTI EFFICACI IN AMBITO DIDATTICO

Rosanna Perrone
Università degli studi di Salerno
rperrone@unisa.it

Lucia Pallonetto
Università degli Studi di Salerno
lpallonetto@unisa.it

Carmen Palumbo
Università degli Studi di Salerno
capalumbo@unisa.it

Abstract

Investigating the complexity of written communication is, specifically, analyzing the sign-graphic difficulties. The quality of the graphic stroke, in fact, implies multiple skills that converge, to give life to a silent conversation, contextually to the psychophysical state (Pesci G., 2004). The graphic gesture is not just a sign left on a sheet, but a representation of the image of oneself. The etiological reasons that define organizational-kinetic deficits such as dysgraphic disorder are to be found in multidimensional aspects (De Ajuriaguerra J. et al., 1979), which find the answers in the total use of the body and not only in eye movements-manuals (Gamelli I., 2011). A preliminary study was conducted through the administration of the BHK scale (Di Brina C., Rossini G., 2021). The survey is aimed at primary school pupils only and the selected sample is made up of 60, aged between 8 and 9, attending the third and fourth year. The main objective is to evaluate the presence of impaired graph-motor skills in developmental age.

Indagare sulla complessità della comunicazione scritta è, nello specifico, analizzare le difficoltà segnico-grafiche. La qualità del tratto grafico, difatti, sottintende pluri-abilità che convergono, per dare vita ad una conversazione silenziosa, contestualmente allo stato psicofisico (Pesci G., 2004). Il gesto grafico non è soltanto una traccia segnica lasciata su un foglio, ma una rappresentazione dell'immagine di sé. Le ragioni eziologiche che definiscono i deficit organizzativo-cinetici come il disturbo disgrafico, sono da ricercare in aspetti multidimensionali (De Ajuriaguerra J. et al.,1979), che trovano le risposte nella totalità dell'uso del corpo e non soltanto nei movimenti oculo-manuali (Gamelli I.,2011). È stato condotto uno studio preliminare attraverso la somministrazione della scala BHK (Di Brina C., Rossini G., 2021). L'indagine è rivolta agli alunni della sola scuola primaria e il campione selezionato è

composto da 60 soggetti, di età compresa tra 8 e 9 anni, frequentanti il terzo e il quarto anno. L' obiettivo principale è quello di valutare la presenza di abilità grafo-motorie di tipo compromesso in età evolutiva.

Key-words

Graph-motricity; Dysgraphia; Primary School; BHK
Grafo-motricità; Disgrafia; Scuola Primaria; BHK

Introduction

Writing may appear from the outside as a quick and natural gesture, but in reality it hides (within itself) an articulated process that can only be done using different skills.

Writing could appear as the product of the exclusive activity of the hand, but this is nothing more than the last piece of a puzzle composed starting from the brain and of which the hand is the operative tool. A very relevant definition of a writing process is the one of Berninger and Whitaker (1993) who define it as «a complex skill that depends on different components, each of which contributes in a specific way to transform heard or thought verbal information into graphemic form» (pp. 623-642).

It is therefore understood that the activity that leads to the learning of writing depends for its success on the maturation and synergistic work of cognitive, linguistic and motor skills deriving from different functional activities.

The different skills that, when integrated, allow written processing are all neurological in nature, starting from motor skills passing through linguistic competence and arriving at the indispensable ability to process stimuli of all kinds (attention, motivation, memory, proprioceptive-kinesthetic and praxic).

In the present research we will begin by placing the focus on the graph-motor aspect of writing and the modalities of its learning.

Although handwriting plays a very important role in the school career, in the last period teachers have registered an increase of slow and almost illegible writing by young students. Yet this type of writing has a transversal value since it concerns all school subjects, to such an extent that we should wonder why it is not recognized as a separate subject in the ministry's programs.

Furthermore, the not achieved automation of the writing movements, during the long lessons (of all subjects) entails a burden for the children and a fatigue to manage, without considering that the awareness of having a bad handwriting could consequently induce a reflex in children to refuse all those subjects that require writing itself.

Once you get into the habit / automation, it is very difficult to correct this misbehavior; it is therefore necessary to take care of the motor aspects of writing very promptly and as early as possible.

In fact, if the child does not learn to program the movements of writing well, he will end up automating an ineffective motor behavior, with the consequence of impoverishing other aspects of the learning of writing (e.g. the acquisition of spelling and syntactic rules) and to constitute a major obstacle in his academic progress (Graham et al., 1997). To support this aspect there are several studies and researches on which a common conclusion is drawn: if there are difficulties in the motor aspects of writing, this will affect the speed, the formal rendering and even the written product (Graham et al., 2000), often finding it difficult to acquire syntactic and spelling rules.

In other words, academic performance will be compromised or at least slowed down.

Giornale Italiano di Educazione alla Salute, Sport e Didattica Inclusiva / Italian Journal of Health Education, Sports and Inclusive Didactics - Anno 6 n. 1- ISSN 2532-3296 ISBN 978-88-6022-436-1 - gennaio - marzo 2022 - CC BY-NC-ND 3.0 IT- https://doi.org/10.32043/gsd.v6i1.538

1. Graphic-motor skills and ergonomic aspects of writing

There are several skills that allow the young student to master the methods of making graphic signs, which basically consist in copying each letter based on a motor model and then joining the letters into words.

These skills must be very well trained to let the child acquire them: they are an essential prerequisite to be able to learn all the graph-motor aspects of writing.

The visual-perceptive skills are necessary for the child to learn the characters that visually mark the letters (graphemes) in the different contexts: the print, the script, the italics. It also serves to ensure that the letters have been drawn up in a complete manner.

Visual-spatial skills provide the ability to distinguish the spatial orientation of a line (horizontal or vertical) or of any graphic sign.

It also defines the reciprocal spatial relationship between two objects which, for example, are located one to the right of another and facilitates the perception of the spaces between the letters and words within the space of the sheet, codifying the meaning of their position.

Visual-motor integration concerns the ability to create a relationship between visual and motor information, such as tracing a geometric figure or even being able to copy it or copy an entire text.

Finally, kinesthesia, also called proprioception, is the ability to choose or discard a certain position of the parts of the body, direct them, calculate the amplitude of their movements and in writing it concerns the grasp and strength needed to follow the direction during the delineation some letters.

The characteristics of correct writing from the graph-motor point of view were identified by Blason and his collaborators only in 2004, inserting them into graph-motor and postural parameters that are capable of influencing the formal rendering of the writing activity. These are the following variables, which we will analyze: speed, readability, directionality, size, spacing between letters and words, alignment of letters on the staff, pressure, body posture and grip of the pen.

By writing speed we mean the time it takes to write the individual letters. It is important because it gives the rhythm to writing and if this is slow, it prevents a fluid flow of ideas and short-term memory, so it is essential that the child automates the correct motor patterns learned and in order to write with a certain speed.

Legibility means identifiability of a grapheme even outside the word in which it appears.

The directionality of the movement concerns the direction towards which the sign that constitutes the letter is executed; it is learned by imitation of the teacher-guide, who has the task of illustrating the movements that must be performed to obtain each letter and who is responsible for checking that they are repeated correctly.

The variable of the size is divided into absolute (proportion between the letters) and relative (proportion between the parts of the same letter).

Space also determines good writing because it helps to read words more clearly. There is an ideal space that should be left between one word and another: it must be equal to the size of an average letter such as the “a”. In fact, if the space between one word and another is equal to or less than 2mm, legibility is compromised.

There is no universal spacing for the right spacing between letters within words.

They should be neither too large nor too small, but simply of a size capable of allowing the word to be recognized.

The letter alignment variable corresponds to the ability to keep all words on the baseline, without invading the space above or below.

The action necessary for the tip of the pen to friction on the sheet and allow the ink to come out corresponds to the force that the child must dose to apply the right pressure on the pen.

And here we are with the pen: while in the past we were very firm on the classic grip of the pen, today there is no single way. The teacher is suggested to help the child to put in place the so-called "dynamic three-finger grip", which is the one that allows the joints to perform free movements and suggests a greater amount of sensory input to the nervous system to perform the necessary motion.

When the grip is not conventional, however, it is no longer mandatory to propose a change of grip to the learner, unless there is a real need for it.

Studying and comparing these standard variables with the learning path of writing undertaken by the learner often allows the teacher to have effective starting points to help the child develop the correct motor pattern.

All this has shown us how complex the task of learning to write is and how much this depends on the maturity of knowing how to amalgamate numerous skills, since the skills required are many and of various kinds.

There are studies (Graham et al., 2000; Jones & Christensen, 1999) which have shown how the difficulties encountered by children in learning the writing process can influence the learning of the aspects following this process, first of all the composition of a written text.

Therefore, the need to intensify the teacher's attention arises from this reflection, especially in the early stages of learning the written language, in order to promptly intervene on the automation of the motor component.

Finally, writing is a motor skill that is defined as "specific domain", which means that the movements required to write are specific and specific only to the writing activity and cannot be traced back to other movement patterns (patterns). So we will never get tired of repeating that the correct learning of a motor skill is absolutely dependent on the repetition of those movements and its memorization, in fact we speak of motor memory. In the absence of this, he will not be able to learn to program the necessary movements for writing and will be led to automate incorrect motor behavior.

Writing is a very complex type of skill, a skill that is acquired only after a long learning process and that requires skills related to higher cognitive processes such as those related to memory, attention, spatial and temporal coordination, therefore also to perceptive and kinesthetic mechanisms.

The ability to write, specifically, requires the involvement of different neural networks that cooperate to implement a sophisticated motor praxis, characterized by a series of fine and oculo-manual movements.

For a child, learning to write is not a simple or automatic activity, in addition to the prerequisites mentioned above, it is a skill that involves continuous coding and recoding of the spelling system, closely linked to the interpretation of the semantic and linguistic code of his identity.

Writing is therefore the final act of a long and complex cognitive process that can be considered "finished" only at the end of the second year of primary school.

Only thanks to an optimal motor and praxic development that corresponds to the age, there can be a correct integration of cognitive and graph-motor skills.

The ability, more generally, is the ability to implement a series of sequential actions quickly and efficiently to reach a goal (praxia) with a minimum expenditure of energy resources and attention (Stella, 2004); skills are therefore consolidated with exercise and repetition, functions at the base of what motor learning is, and which allows uncertain and uncoordinated movements to become fluid and repeatable. We then reach what is called automation, that is, a level of mastery that becomes instrumental and therefore functional (Pratelli, 1995).

The graphic act is, therefore, a combination of movements that gives rise to graphic signs with expressions of meaning, which however requires speed, fluidity and executive precision. (Olivaux, 2014).

It follows that the lack of these skills and, above all, the lack of integration between them, will not allow rapid processing of the information that should give life to a motor program, that is the product of the completion of biological processes and environmental stimulations to which the subject is submitted.

In this regard, it should be noted that «motor functions are the result of internalization and spatial-temporal structuring processes, [...] the progressive transformation of corporeality and motor skills follows a line of development that proceeds from a global adaptive dimension to a motility understood as an organized system» (Carboni, 2013, p.80).

When we speak of body and learning, it is legitimate to speak of corporeality and of all the existing dimensions from the mind to the body, to the soul; there can be no functional learning if one of these three dimensions is not predisposed to be able to work synergistically with the other two.

Moreover, «corporeality does not only concern the initial time of the child's first explorations, it concerns the span of his entire life and so also the learning processes are linked to an infinite time, that is to the dimension of long life learning» (De Anna, 2014, p. 25).

The act of writing is therefore a psychomotor act in all respects, and involves the systemic integration of factors which, thanks to the movement of the hand and the grasping of the pen, take shape in order to perform what is defined as a praxia (Sabbadini, 2005).

Being able to write, therefore, is a skill that involves the use of multiple mechanisms linked to the involvement of higher neural structures skillfully processing a written text using attentional, coordination and mnemonic skills (Sabatini, 2016).

Graph-motor skills define the school life of a child especially in primary school and starting from the second year of the first cycle of education, reading and writing skills should be fully acquired in various styles such as capital print, script and italics.

2. Dysgraphia

Dysgraphia is the difficulty in reproducing whatever alphabetic or numerical sign. It compromises the grapho-motor activity necessary for writing and is independent of linguistic variables, but it is not linked only to the motor component of writing (Graham et al., 2000; Jones & Christensen, 1999).

In fact, the Consensus Conference on Specific Developmental Learning Disorders of 2007 and the law 170 passed in 2010 include dysgraphia among the Specific Learning Disorders (DSA), and article no. 1 of the aforementioned, quotes verbatim "For the purposes of this law, dysgraphia means a specific writing disorder that manifests itself in difficulty in the graphic realization".

Consequently, the scientific community agrees on the inclusion of dysgraphia within specific learning disorders and often defines it as a disorder that exclusively concerns the grapho-motor component of writing, so it involves deficits in the process of graphics realization; it often does not present itself as an isolated disorder, but in comorbidity with other ASDs and typically in children with motor coordination disorders.

Writings with dysgraphia are often distinguished by the child's difficulty in using space, as he does not have references that allow him to orientate himself: for example, he does not stick to the margins of the sheet, does not follow the line, etc ...

Often dysgraphs are unaware of the due size of the letters which at times draw too large and at times too small, while at other times they join the letters in an irregular way.

In some cases, they even reverse the direction of the gesture or when they write individual graphemes or when they write words.

Many times dysgraphic children do not make use of the ideal dynamic three-finger grip, also keeping the body in an inappropriate posture and the non-writing hand is often lolling or away from the paper.

Furthermore, the pressure of the hand on the paper is either too strong or too weak and the hand often trembles. The writing rhythm is never balanced (too fast or too slow), the gesture is jerky, interrupted, not fluid.

According to some studies, dysgraphia can only be corrected if the pupil is treated with ad hoc programs and that, on the contrary, if the dysgraphia is not treated, it will tend to persist (Smits-Engelsman and Van Galen, 1997).

In 2010 the Italian Association for Research and Intervention in Learning Psychopathology (AIRIPA) created a working and study group for this disorder, which found that it is necessary to differentiate a simple difficulty in writing - which can be due to emotional factors and only temporary - from a real disorder, which is recognized because it derives from severe difficulties of the child and is rooted in time, which therefore requires re-education. Furthermore, the group also came to the demonstration that the parameter of the readability of the handwriting does not make use of the finding of a bad handwriting, but of the possibility for a reader or writer to effortlessly decode the paper.

Dysgraphia is therefore a specific learning disorder, which is caused by a motor deficit, the etiological reasons of which are to be found in the impairment of the abilities relating to space-time perception and fine coordination (De Ajuriaguerra et al., 1979).

Dysgraphia must therefore be conceived as a primary disorder and not secondary to other disorders or attributable to unfavorable socio-environmental conditions, but as a functional disorder, affecting the coordinative and organizational processes of executive functions, since the writing process includes a complex system of perceptive, symbolic and intellectual actions, where the whole body is involved (Crispiani, 2004).

Reflecting on the possibilities and at the same time on the involvement of the body in the learning processes in developmental age is of fundamental importance, as well as the learning environment. Specifically, however, for a subject in developmental age it is necessary to have fundamental prerequisites to be able to develop skills and essential tools to face school life, and to be able to reach autonomy, the ultimate goal of the teaching-learning process. In his environment the learning child needs the necessary educational resources to express his potential and to be able to carry out his motor actions.

Writing, in fact, means acting on a motor basis but, at the same time, associating significant graphemic productions, which are understandable and interpretable from a communicative point of view. Graph-motor skills, if not acquired within the expected development times, ask questions about the possibility that there may be a specificity of a disorder, therefore, a specific learning disorder, consequently a possible diagnosis of dysgraphia could take place. Letizia Sabbadini (2005) defines it as “a disorder on a dyspraxic basis”, which manifests itself in the evident difficulty in graphic production, in both qualitative and quantitative terms, which risks not being comprehensible, therefore, legible, functional and fluid.

Dysgraphia is a specific difficulty that could have comorbidities also present with the language disorder, with problems related to coding and automatic retrieval of phono-articulating information. It also underlines «the importance of developing phonemic awareness before the formal teaching of reading and writing [...]» (Tressoldi, 1991, p. 363).

Most of the activities carried out starting from kindergarten have as their ultimate goal the acquisition of prerequisites necessary to be able to face a satisfactory learning process of reading and writing. This procedure must take place along a path that includes activities that develop visual-perceptive and graph-motor skills, preparatory to the executive aspect of reading-writing, but which at the same time also stimulate linguistic fluidity, phonological awareness, lexicon and syntax. Activities of this type should be in preschool but also school age, and should be structured in a balanced way aiming to work on the prerequisites of learning to read-write by exercising eye-manual coordination,

Therefore, exploiting the potential of the body as a tool in learning processes assumes an important value, since if a child who is intent on living his daily and school life through movement, he will tend to exploit the totality of his body by merging the movements with the ‘expressiveness and communication.

3. Grapho-motor evaluation in developmental age

Materials and methods

The instrument used for this analysis is the “BHK - Synthetic scale for the evaluation of writing in developmental age”, an Italian adaptation of the Dutch original by Hamstra-Bletz, De Bie and Den Brinker (Di Brina & Rossini, 2011).

The BHK scale is specific for the evaluation of the graphic stroke for primary school children, and consists of a standard test presented in lowercase print to be copied in italics on a white A4 sheet. The task is to be done in exactly 5 minutes. The parameters analyzed are 13 and take into account the quality of the graphic gesture.

These parameters are:

1. Greatness of writing;
2. Left margin not aligned;
3. Fluctuating trend of the writing line;
4. Insufficient space between words;
5. Sharp angles or elongated links;
6. Broken links between letters;
7. Collision between the letters;
8. Irregular size of the letters;
9. Inconsistent measurement between letters with and without extension;
10. Atypical letters;
11. Ambiguous forms of letters;
12. Retouched or traced letters;
13. Unstable trace, uncertain and shaky writing

The destabilizing aspect of the blank sheet, without pre-structures of coded lines, increases its degree of difficulty, and the child is required to recruit all his coordination skills in the space of the sheet to complete his task, trying to reconcile clarity and correctness of writing. The 13 parameters are then grouped into 3 areas of observation: ORG (Spatial organization), MOT (motor skills), FOR (shape of graphemes); to these is added the VEL (Number of characters written in 5').

Aims

This preliminary research study, which aims to be a kind of experimental qualitative-quantitative fieldwork, has the following objectives: to evaluate the grapho-motor skills of writing in developmental age, to identify subjects with impaired graph-motor skills or non-functional and propose effective teaching tools.

Sample

The sample in question is made up of 60 subjects, aged between 8 and 9, attending the third and fourth year of a primary school in the province of Naples.

Data analysis and discussion

The evaluation is carried out on the first five lines of the standard text to be copied foreseen by the scale, and in the results the total scores are considered as obtained from the sum of the single parameters from the first to the thirteenth (Table 1.).

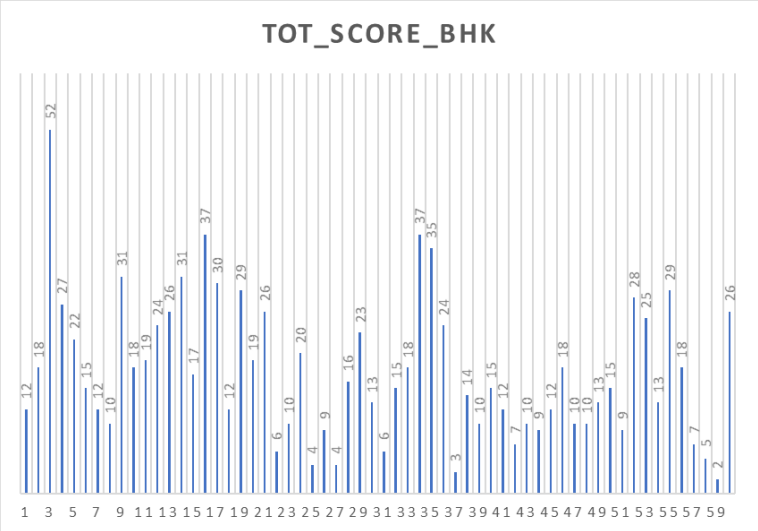

Table 1. Total Score Scale BHK.

The 13 parameters were grouped into the four observation macro-areas where a descriptive analysis was carried out (Tab.2), making a calculation of the mean and standard deviation; subsequently, an analysis with ANOVA (Tab.3) (SPSS) was also carried out in which it was possible to make a differentiation with and between the groups in which no gender significance emerges: an important aspect that reveals that there is no gender-related tendency.

From the emerged data it can be observed that among the macro-areas of the BHK scale there are differences to be taken into account: the areas in which the greatest difficulties were recorded are those relating to motor skills (MOR) and to the shape of graphemes (FOR).

	Genere	N	Mean	Std. Deviation	Std. Error
ORG	F	29	4,14	3,55	,66
	M	31	5,68	3,79	,68
	Total	60	4,93	3,73	,48
MOT	F	29	5,55	3,56	,66
	M	31	6,71	3,82	,69
	Total	60	6,15	3,71	,48
FOR	F	29	5,34	4,85	,90
	M	31	7,32	4,06	,73
	Total	60	6,37	4,53	,59
VEL_5'	F	29	170,28	45,42	8,43
	M	31	177,48	45,49	8,17
	Total	60	174,00	45,21	5,84

Table 2. Descriptive analysis

		Sum of Squares	df	Mean Square	F	Sig.
ORG	Between Groups	35,51	1	35,51	2,63	,111
	Within Groups	784,22	58	13,52		
	Total	819,73	59			
MOT	Between Groups	20,09	1	20,09	1,47	,231
	Within Groups	793,56	58	13,68		
	Total	813,65	59			
FOR	Between Groups	58,61	1	58,61	2,95	,091
	Within Groups	1153,33	58	19,88		
	Total	1211,93	59			
VEL_5'	Between Groups	778,46	1	778,46	,38	,542
	Within Groups	119823,5	58	2065,92		
	Total	120602,0	59			

Table 3. ANOVA

Instead, below, we report two comparative spellings for a qualitative observation of the graphic act, specifically the subjects presented two ex equi scores of 37 points, of a subject who has no certified disability diagnosis (Fig. 1) and of another subject who has a diagnosis of Generalized Developmental Disorder (Fig. 2).

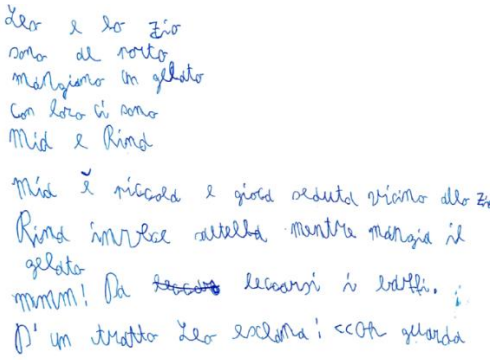

Figure 1. Subject without known difficulties and in the absence of certified disabilities.

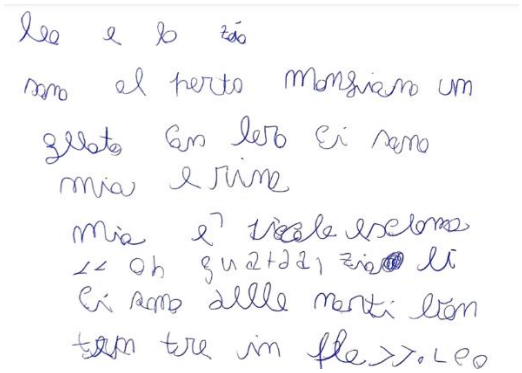

Figure 2. Subject with certified disability and diagnosed with "Generalized Developmental Disorder".

Information on any certified disabilities was intentionally collected from the subjects, an aspect that must be taken into consideration during the assessment phase due to the often present comorbidities.

In the first case (Fig. 1.) We can see how the handwriting, although organized at a spatial level in a better way than in the case with disabilities, has a fluctuating feature with an unstable trace and visible tremors. This type of handwriting should lead the reference teacher to think that there is a need to undertake a systematic observation process by experts, who monitor the subject's academic progress, to check the presence of a disorder at a coordinative and motor-praxic or dysgraphic level, since acute angles, collisions and superimpositions between letters are noted in some parts of the text; moreover, the writing fluctuates on the line and there are several ambiguous letters with atypical dimensions.

In such a subject it would be advisable to check with periodic evaluations, and if the child in question may be dysgraphic and has a delay with respect to the calligraphic age, or dyspraxic, or if he has psycho-affective problems.

In the person with disabilities (Fig. 2) it can be assumed that there is an organizational-spatial deficit that from the motor and consistently with the certified diagnosis, also moves into the spatial organization of the sheet, and certainly in cases like this it would be desirable to intervene with a path of re-education of writing, which picks up on specific and pre-scriptural techniques.

Finally, from the results obtained, it is clear how important it is that a graph-motor evaluation model could be proposed and subsequently implemented in the didactic field. The reflection emphasizes the inclusion of graph-motor assessment procedures, consistent with the school-curricular organization.

Having a full awareness of one's body and of the space-time conception means being able to exercise one's actions also improving cognitive abilities, as well as cognitive learning abilities with respect to primary reading and writing skills.

The graphic act therefore assumes a fundamental meaning in the developmental life of the child, precisely because in addition to having repercussions on academic achievement, it could compromise the possibility of being able to express oneself, therefore, also having negative effects on his emotional and psychological sphere.

At the end of this study it is possible to assert that the evaluation and instrumental supports foreseen in the usual didactic practices are lacking.

It is important to understand that the learning of writing techniques, together with those of reading, represents one of the main activities, and constitutes the instrumental and functional key element in the continuation of primary school and school life. Knowing how to read and write, that is, knowing how to decode, understand and produce a written text allows the learner to pursue their training independently and also according to self-learning paths.

There is therefore a need to improve and strengthen teaching procedures and teaching strategies, but this is not possible without targeted technical and methodological support.

Understanding the communicative nature of a text and making it one's own plays a decisive role in the process of autonomy and growth of the learner.

Conclusions

Unlike teaching, learning is an autonomous process, an "independent variable", which only needs the resources and the environment suited to the needs of the pupil. In other words, without the contribution of adequate techniques and devices, the process of understanding and subsequent autonomous production may not be possible or not satisfactory. The processes of understanding, coding, decoding and written production pass through the knowledge already possessed by the subject who reads, the result of previous knowledge and experiences also of an intuitive nature, but he must be able to transpose the graphic signs read into the meanings corresponding to the communication code to which he belongs. Consequently, writing, although oral communication is the most direct form of communication, effective and used in today's world, essentially remains the method that leaves a clear trace of who we are, of how we actually want to expose ourselves, of how we want the other to perceive us and this is not always possible in words. The written communication channel is the most private and perhaps the freest in terms of deep tangible reflections, and even if the digital world has taken over, in order to communicate we need to know how to write and to do so we need to know a series of alphabetic codes and knowing how to use it in view of the purposes to be implemented.

To be able to write it is necessary that there is an optimal development of all those factors that are involved in learning, and in this regard the teaching can propose to provide a multisensory stimulation, with particular attention to motor skills, in order to give it its pivotal role and proactive in teaching practices; specifically, it is good to give importance not only to the "product" but above all to the "process" and the graphic gesture as a motor and cognitive practice.

It is therefore important to lay some foundations in daily practices and reflect on the possible improvement and implementation of methods and strategies that introduce reading and writing techniques that take into account the prerequisites of these skills, the possibility of evaluating and then designing educational paths that do not exclude the role of the body in learning processes (Sibilio, 2013). We need to reflect on the meanings that movement can include, on how much children both in kindergarten and primary school need to use their bodies to communicate and to convey their emotions or needs. According to Vayer (1974) «Psychomotor education considers the child as a whole: the harmonious development of all aspects of the personality can be favored only through the education of the being in its totality. [...] from the educational point of view, psychomotor education is a general education of being through the child's body» (pp. 46-47).

The exclusion of a possible involvement of appropriate psychomotor index practices in teaching is penalizing for the purpose of improving manual motor skills, including writing which is one of the most complicated manual and practical activities, especially for a child in

the learning phase, since writing is not an intuitive skill but it must be acquired gradually through a specific didactic process, and in some cases a personalized one.

In this regard, we believe that the evaluation of graphical-motor skills is a prerequisite for planning but also and above all for a didactic redesign in case of graphic and writing difficulties, and that a psychomotor education with particular attention to manual activities is ideal to favor a complete learning that makes the writing process autonomous, therefore, learned.

References

Berninger, V. & Whitaker, D. (1993). Theory-based branching diagnosis of writing disabilities. *School Psychology Review*, 22, 623-642.

Blason, L., Borean, M., Bravar, L. & Zoia, S. (2004). *Il Corsivo dalla A alla Z. La teoria*. Trento: Edizioni Erikson.

Consensus Conference (2007). Disturbi Evolutivi Specifici dell'Apprendimento: raccomandazioni per la pratica clinica definite con il metodo della Consensus Conference.

Crispiani P. (2004). *Didattica cognitivista*. Roma: Armando Editore.

De Ajuriaguerra J., Auzias M., Coumes, F., et al. (1979). *Children's Writing. The Evolution of Writing and Its Difficulties*. 3rd edn. Paris: Delachaux & Niestle.

De Anna L. (2014) *Pedagogia speciale. Integrazione e inclusione*. Roma: Carocci editore.

Di Brina C., Rossini, G. (2021). *BHK. Scala sintetica per la valutazione della scrittura in età Evolutiva*. Trento: Edizioni Erickson.

Gamelli I. (2011). *Pedagogia del corpo*. Milano: Raffaello Cortina.

Gargano D. (2013). *Disprassie evolutive*. Trento: Erickson.

Graham S., Harris, K.R. & Fink, B. (2000). Is Handwriting Related to Learning to Write? Treatment of Handwriting Problems in Beginning Writers. *Journal of Educational Psychology*, 92,620-633.

Jones, D. & Christensen, C.A. (1999). Relationship Between Automaticity in Handwriting and Students' Ability to Generate Written Text. *Journal of Educational Psychology*, 91, 44-49.

Olivaux R., (2014). *Pedagogia della scrittura e grafoterapia.* Roma: Epsylon

Pellegrini, R. & Dongilli, L. (2010). *Insegnare a scrivere. Pregrafismo, stampato e corsivo*. Trento: Edizioni Erikson.

Pesci G. (2004). *Percorso Clinico. Aiuto della persona*. Roma: Edizioni Scientifiche Ma. Gi. srl.

Pratelli M. (1995). *Disgrafia e recupero delle difficoltà grafo-motorie.* Trento: Erickson.

Sabatini F. (2016). *Lezione di italiano.* Milano: Mondadori.

Sabbadini L. (2005). *La disprassia in età evolutiva: Criteri di valutazione e intervento.* Milano: Springer.

Sibilio M. (2013). *La didattica semplessa*. Napoli: Liguori Editore.

Smits-Engelsman, B.C.M. & Van Galen, G.P. (1997). Dysgraphia in Children: Lasting Psychomotor Deficiency or Transient Developmental Delay? *Journal of Experimental Child Psycholgy*, 67, 164-184.

Smits-Engelsman, B.C.M., Shoemaker, M.M., Van Galen, G.P. & Michels, C.G.J. (1996). *Physiotherapy for Children's Writing Problems*. In: M.L. Simner C.G., Leedham C.G. &Thomassen A.J.W.M. *Handwriting and drawing research: Basic and applied issues*. Amsterdam: IOS Press, 227-240.

Stella G. (2004). *Dislessia.* Bologna: Il Mulino.

Tressoldi P. (1991). *I disturbi strumentali di lettura e scrittura*. In C. Cornoldi (a cura di), I disturbi di apprendimento. Bologna: Il Mulino.

Vayer P. (1974). *Educazione psicomotoria nell'età scolastica.* Roma: Armando Editoree, pp. 46-47.