

A cura di
CATIA GIACONI E NOEMI DEL BIANCO

E-HAND. EMPOWERING CHILDHOOD HANDWRITING



TRAIETT**O**RIE
INCLUSIVE

FrancoAngeli 



TRAJETTORIE INCLUSIVE

COLLANA DIRETTA DA
**CATIA GIACONI, NOEMI DEL BIANCO
SIMONE APARECIDA CAPELLINI**

La collana “Traiettorie Inclusive” vuole dare voce alle diverse proposte di ricerca che si articolano intorno ai paradigmi dell’inclusione e della personalizzazione, per approfondire i temi relativi alle disabilità, ai Bisogni Educativi Speciali, alle forme di disagio e di devianza. Si ritiene, infatti, che inclusione e personalizzazione reifichino una prospettiva efficace per affrontare la complessa situazione socio-culturale attuale, garantendo un dialogo tra le diversità.

I contesti in cui tale tematica è declinata sono quelli della scuola, dell’università e del mondo del lavoro. Contemporaneamente sono esplorati i vari domini della qualità della vita prendendo in esame anche le problematiche connesse con la vita familiare, con le dinamiche affettive e con il tempo libero. Una particolare attenzione inoltre sarà rivolta alle comunità educative e alle esperienze che stanno tracciando nuove piste nell’ottica dell’inclusione sociale e della qualità della vita.

La collana presenta due tipologie di testi. Gli “*Approfondimenti*” permetteranno di mettere a fuoco i nodi concettuali oggi al centro del dibattito della comunità scientifica sia nazionale, sia internazionale.

I “*Quaderni Operativi*”, invece, documenteranno esperienze, progetti e buone prassi e forniranno strumenti di lavoro per professionisti e operatori del settore.

La collana si rivolge a tutti i professionisti che, a diversi livelli, si occupano di processi inclusivi e formativi.

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E-HAND. EMPOWERING CHILDHOOD HANDWRITING

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Conclusions and inclusive trajectories

by *Noemi Del Bianco*

In order to outline the main pedagogical lines, useful for the implementation of inclusive contexts, in this chapter we will conclude our reflection by highlighting some fundamental dimensions for the educational care of students with SpLDs.

The first area that presents itself as central is that of prevention, with a focus on the dissemination of a preventive culture. In this regard, Special Pedagogy (Giaconi & Capellini, 2015) suggests promoting early and careful observation of students in learning contexts and the definition of possible lines of intervention on reading, writing and calculation prerequisites. Another key step is the introduction of school screening, which should be started already in the last years of preschool and the first years of primary school.

Alongside this, we also emphasise the integration of new technologies as support tools in the detection of possible signs preceding the manifestation of disorders. Given the growing research interest in this area, it is plausible to assume that the reliability and applicability of technologies in screening protocols will continue to improve as scientific and technological advances enhance their accuracy and effectiveness.

The integration of advanced digital tools will allow not only for the refinement of observation and screening protocols, but also for the early detection of possible difficulties, enabling timely and targeted interventions (Kunhoth *et al.*, 2024). Looking forward, these technologies could also be applied to school enhancement

programmes, contributing to a more effective management of learning difficulties. The school, as a constantly evolving environment, requires tools capable of adapting to an increasingly complex reality, in which the personalisation of teaching and support for students with special needs are fundamental aspects. Consequently, the adoption of evaluation and monitoring procedures that are timely, continuous and sustainable will increasingly become a necessity. In order to meet these challenges, technological tools will have to ensure multi-dimensional monitoring, capable of capturing the complexity of transversal development processes and, at the same time, provide a detailed analysis of specific learning areas. This approach will make it possible not only to identify any critical issues, but also to target educational interventions more effectively, promoting personalised and accessible learning for all students.

For instance, the use of Artificial Intelligence and Machine Learning systems could refine intervention strategies, allowing for more and more customised implementation methods. Predictive models developed through Machine Learning could, in fact, provide real-time suggestions to teachers, indicating which strategies are most effective for each pupil and which aspects need more attention. Adaptive software can calibrate the difficulty level of exercises according to the student's skills, providing immediate feedback and adapting content to maximise learning. This is particularly useful for students with graphomotor difficulties, who can benefit from handwriting-assisted tools and applications that promote fluidity of the graphic gesture.

As can be seen from the project proposal carried out, the observation of graphomotor skills, also made possible by the use of advanced technologies, made it possible to investigate the fundamental parameters of handwriting, such as pen pressure, stroke speed and fluidity, as well as the posture adopted during the act of writing (Engel-Yeger, Nagauker-Yanuv & Rosenblum, 2009). Technologies such as graphomotor analysis make it possible to collect data on movements and posture while writing, offering tools to monitor students' writing in real time and to identify dysfunctions in motor skills at an early stage (Penge, 2010). The use of innovative digital tools can therefore be seen as a significant opportunity to

improve the early detection of difficulties and to propose personalised interventions based on the objective analysis of collected data (Ceccacci *et al.*, 2024). The integration of technology and educational methodologies, as highlighted in the project “E-Hand. Empowering Middle Childhood Handwriting”, represents a promising perspective in supporting students with SpLDs. The combination of digital tools for graphomotor monitoring and artificial intelligence algorithms for data analysis makes it possible to identify specific difficulties more precisely and to develop customised intervention strategies (Danna *et al.*, 2023).

The implementation of these technologies will also require an ongoing commitment to training school staff so that teachers are adequately prepared to use these tools and interpret them correctly. Indeed, the interconnection between technology and special pedagogy requires specific training for teachers so that they can make the most of the potential offered by the new digital tools. For these reasons, staff training appears to be a further point for reflection, as mere access to technologies is not sufficient for the realisation of inclusive learning environments without adequate preparation for the pedagogical use of these tools. The need to train teaching staff is not limited to the acquisition of technical skills of the tools but includes a broader dimension of methodological and critical awareness of their pedagogical implications, in order to ensure their effective integration into learning/teaching pathways. Teachers must, in fact, be able to assess the impact of technologies on the learning process and adapt them to the specific needs of each student, especially in inclusive contexts. This implies the acquisition of skills for the personalisation of teaching paths, the management of digital tools as support for special educational needs and the ability to interpret data collected by analysis software for a more targeted and effective educational intervention. Since inclusive teaching cannot be limited to the adoption of technological tools, but must involve an overall rethinking of teaching methodologies, favouring differentiated and personalised approaches (Giacconi & Capellini, 2015), truly inclusive teaching must therefore be based on flexible didactics that take into account the diversity of students, adapting materials, assessment methods and learning rhythms so as to favour the full participation of all. This

means rethinking the role of the teacher as a facilitator of the learning process, able to use new technologies to build stimulating and accessible educational environments.

The effective integration of digital technologies and educational strategies therefore requires a constant commitment to training, research and didactic experimentation, so that every student can benefit from a quality education, built on their abilities and potential. The evidence that has emerged in the previous chapters therefore underlines the need for a cultural change in the approach to SpLDs, which sees the school not only as a place for transmitting knowledge, but as an environment capable of adapting to the needs of each pupil. For these reasons, as Giaconi and Capellini (2015) point out, the creation of effective inclusive practices cannot be separated from a strong collaboration between school, family and university. Only through constant dialogue and synergetic work between research, technological innovation and inclusive education will it be possible to develop educational paths based on solid scientific evidence, but also on the experience and practical needs of teachers and students. This requires an ongoing commitment to the experimentation and implementation of new strategies that integrate the results of scientific research with everyday educational practices. Collaborative research between different actors in the educational world thus appears to be the key to making school inclusion not just a theoretical principle, but a concrete and effective reality for all students, including those with Specific Learning Disorders.

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