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Compendium

Future Perspectives  
on Accessibility,  
AT and (e)Inclusion

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**Aim and scope:** To communicate and complete knowledge on ICT, AT and Accessibility for/with people with disabilities and older adults and connect research in these domains with the necessary practical background and user related aspects.

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## Editorial

Welcome to the 3rd edition of our Open Access Compendium! After an intense co-operation with AAATE in 2022, we represent again ICCHP and “Future Perspectives on AT, Accessibility and (e)Inclusion”, published on the occasion of ICCHP 2024 at Linz University, Linz, Austria.

After the Open Access Journal’s first two editions, the “Future Perspectives of AT, eAccessibility and eInclusion”, ICCHP continues this publication covering a more practical view on AT, Accessibility, ICT with and for people with disabilities and older adults.

These last 2 years were subject to significant changes in ICT and all connected areas – AI and Large Language Models revolutionize education and term paper writing. E.g. Chat GPT writes Program Code – and Graphical AI – like e.g. Midjourney draws the pictures to it. Data Scientists already talk about “intelligence” and the threat of Super-Villain AIs manipulating political systems and elections.

AI also shows a merciless picture on how “society” or at least “the internet” sees and discusses “disability”, “inclusion” and “Assistive Technology”. In case you did not do so already, try it and ask e.g. Midjourney to draw a picture by just giving the terms Disability or Assistive Technology and see firsthand some main issues in the societal discourse that keeps us all from reaching our goals, accessibility and participation for “All”. You will not see edge of tomorrow tech, nor laptops or tablets used by a person with a disability to take part in education or society – in most cases you see people in old, not fitting wheelchairs – and they are in most cases alone, standing in due distance from “where life is”.

Asking ChatGPT to “Write 200 words in editorial style elaborating the potential of artificial intelligence, large language models and pervasive computing in making IT, internet and life more accessible to people with disabilities in the future also mentioning privacy and data security issues” delivers the following:

“Artificial intelligence (AI), large language models (LLMs), and pervasive computing hold tremendous promise in revolutionizing accessibility for individuals with disabilities. These technologies can transform how people interact with IT and the internet, fostering a more inclusive society.

AI, with its capacity to learn and adapt, can be integrated into assistive devices to enhance their functionality. For instance, voice recognition and natural language processing (NLP) can empower those with mobility impairments to control computers and smart home devices through voice commands. Similarly, computer vision can aid visually impaired individuals by describing their surroundings or reading text aloud.

LLMs like GPT-4 can significantly advance communication aids for individuals with speech or language disorders. By understanding context and generating human-like text, these models can assist in generating coherent, contextually appropriate responses, facilitating smoother communication for those who struggle with conventional methods.

Pervasive computing, embedding computing power in everyday objects, ensures constant support and accessibility. Smart environments can adapt to users' needs in real-time, offering tailored assistance and reducing barriers to accessing information and services.

However, these advancements also raise significant privacy and data security concerns. The reliance on vast amounts of personal data necessitates robust data protection frameworks to prevent misuse. Ensuring that AI systems are transparent, secure, and respect user privacy is crucial. As these technologies evolve, balancing innovation with ethical considerations will be vital to create a truly inclusive digital future.”

So then – let’s create, use and work together and make the best of this potential to foster and promote our mission in the right direction! We hope that this third edition of our Open Access Compendium delivers memories, knowledge and also new aspects to you – and to come back in 2026; again renewed, bigger and even more relevant and exciting.

Andrea Petz and Klaus Miesenberger, Editors

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## 7. A Pedagogical Model for In-Situ Training Interventions: Creating Inclusive Educational Pathways with Assistive Technologies through the Support of GLIC Assistance Centers for the Ministerial "Sussidi" Grant.

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### Abstract

This study examines a pedagogical model devised by a Center associate to the Italian AT Network GLIC, designed to enhance inclusive education through the deployment of Assistive Technologies (AT). Centered around an innovative support framework for teachers, this model operates as an in-situ informational and training desk in the Campania region, aiming to foster inclusive educational environments. By integrating technological aids and didactic supports tailored for students with disabilities and special educational needs, the initiative seeks to address the accessibility challenges within the traditional educational landscape.

Anchored by the national "Sussidi" Grant since the 2017-18, this initiative has facilitated the provision of assistive technologies, aids, and teaching supports to state public schools. The research underscores a preliminary evaluation of the service's outcomes by analyzing aid requests from teachers of Salerno province who have applied for the grant.

The interdisciplinary team center's efforts have contributed to promoting inclusive and accessible educational content. Empirical evidence from the last three grant cycles illustrates the positive impact of these educational interventions, substantiating the crucial role of AT in fostering an inclusive learning environment. This study highlights the increased specialization in requested assistive technologies, underscoring the evolving needs within inclusive education frameworks.

Keywords: Teaching aids, assistive technology, training, education, enabling environments.

### Introduction

This article presents a pedagogical support model designed for educators, implemented as an on-site informational and training support desk provided by Manè Social Enterprise, an Assistive Technology (AT) Center located in the Campania region and affiliated with GLIC, the Italian Network of Consultancy Centers on Assistive Technology. GLIC, established as an interregional group in 1996, comprises more than twenty Italian centers that serve as reference points in the domain of computer and electronic aids for individuals with disabilities. These centers are stable, non-commercial entities, either public or private, that do not engage in the sale of technology but have instead initiated ongoing technical and scientific discourse and collaboration.

The centers within the GLIC network share commonalities in providing a range of services at various levels, including information, counseling, support, training, and research. Each center is staffed with a team and equipped with a range of aids and proposed solutions to address various challenges of independence in daily living contexts.

The initiative aims to foster the creation of inclusive educational environments through the integration of technological aids and educational supports tailored to students with disabilities and special educational needs. The research focuses on a pre-liminary evaluation of the outcomes of this service by analyzing the requests for aids submitted by teachers who participated in the "Sussidi" - Teaching Aids & Assistive Technology - grant in the province of Salerno.

## State of the Art

### The Ministry of Education "Bando Sussidi" Aids Grant

Since the 2017-2018 school year, the Italian Ministry of Education has launched an experimental program providing assistive technologies, aids, and educational supports to state public schools upon request. This initiative, known as the "Sussidi Grant," was established under Legislative Decree 63 of 2017 to promote specific actions aimed at achieving school inclusion goals.

Under the "Sussidi Grant," school institutions and their educators may apply for subsidies and supplementary systems for teaching, thereby facilitating accessible learning for students with disabilities. This initiative calls for the design and execution of projects tailored to the individual needs of students certified under Law 104/92. Leveraging its experience supporting schools since 2007 in Campania, the Manè team has developed a range of initiatives to enhance educators' access to supportive tools through on-the-job training. The interdisciplinary team at the Manè Center, comprising experts in assistive technology (AT), bioengineering, psychology, computer science, and social innovation, offers guidance and support to educators in selecting appropriate educational and assistive technologies based on the specific needs of students. The primary objective is to equip educators with the knowledge and skills necessary to create tailored applications for technological aids.

Active since 2020 in the province of Salerno, the help desk serves both curricular and support teachers across all educational levels and disciplines. Drawing on Italian research into pedagogy and assistive technologies, the discourse on technological inclusion in education is enriched with directly applicable perspectives and practices. The implementation of assistive technologies through the "Sussidi" grant provides critical support to educators and students with disabilities, enabling inclusion, access to educational content, and active participation in school activities. In recent years, the Manè Center has initiated various training and refresher initiatives targeting curricular and support teachers, with a focus on inclusion, accessibility, and the integration of educational and assistive technologies. These efforts are bolstered by multiple consulting and evaluation help desks, which determine the most suitable technologies for each student's needs.

### The role of CTS - School Support Center - in Creating Inclusive Educational Pathways with Assistive Technologies through.

The role of CTS schools is crucial as they represent a public territorial network of Centers for Aids throughout the country. These centers are tasked with initiating training programs for both general and specialized teachers, disseminating knowledge, sharing good practices, and providing resources (both hardware and software) to enhance school inclusion for pupils with disabilities using New Technologies.

CTSs facilitate the procurement and efficient employment of new technologies for school accessibility. Established under the New Technology and Disability (NTD) project and distributed evenly across the country, the Network of CTSs provides ad-vice and training to teachers, parents, and pupils concerning technologies applied to students with disabilities. There are currently 100 Territorial Support Centers operational throughout Italy, around one per province and three in the metropolitan bigger areas such as Rome, Milan and Naples.

## The Training Proposal of the AT Center “Manè Social Enterprise”

Specifically designed to bolster the CTS school, the School Support Center, and the schools within the province of Salerno, the training initiatives aim to enable educators to discern and integrate the most appropriate educational aids and technologies within their pedagogical frameworks. Empirical evidence gathered from field observations and data analysis for the last three iterations of the "Sussidi" Grant (2021/22, 2022/23, 2023/24) offers a robust foundation for appraising the positive impact of these educational interventions. This data underscores the effectiveness of the undertaken actions and accentuates the pivotal role of the Assistive Technology (AT) Center in assuring the seamless integration of AT in educational environments. The tangible influence observed in educational dynamics and student advancement underscores the substantial benefits of the training support provided by the Manè AT Center, both in enhancing the inclusive education process and in fostering progressively inclusive educational settings. Following the identification of suitable AT, the team proceeded to support teachers in optimally utilizing the aids allocated under the "Sussidi" Grant, through targeted training interventions tailored to the specific aids and technologies provided.

## Methodology

The team collaborated synergistically with the existing materials and human resources in the field, endeavoring to establish mechanisms of change pertinent to the educational contexts under reference. Consequently, this article presents a comprehensive overview of the seminal interventions implemented by the Manè Center within educational settings, alongside the favorable outcomes these have engendered in promoting inclusive instruction, sensitive to the distinct attributes of students. The Manè Center's suite of training programs, supportive frameworks, and specialized consultancy services engaged educators and students ranging from primary to secondary levels within the province of Salerno. The student cohort exhibited a diverse range of disabilities, including instances of concomitant impairments. The primary aim of these interventions was to tailor the selection of strategies and tools - including aids, technologies, and AT - to the pedagogical needs of individual students.

To identify instructional strategies and assistive technologies best suited to the specific needs of students, the Manè Center established counseling and assessment desks for teachers in the province of Salerno who requested them. The counseling sessions were attended not only by teachers, as appropriate, but also by the student's curricular teachers, the student's parents, and the student themselves. The counseling and evaluation intervention included interviewing the student's teachers for data collection, taking charge of the request and analyzing the demand made by the school; observing the student in the practice of daily school life to detect specific needs and residual abilities; and conducting tests of the use of aids and AT provided by the CTS, in relation to the student's disability and educational need. As a result of the counseling desk conducted, the Center prepared a technical report, reporting the assessment and indication of the strategies and aids deemed most appropriate for the student to ensure his or her access to education and school inclusion.

Subsequently, the technologies pinpointed during this process became central to the applications submitted by educators and institutions in conjunction with their participation in the annual "Sussidi" Grant.

In addition to the training counters, which were activated at the request of teachers and schools to meet the educational needs of specific students, the methodological approach adopted also entailed conducting face-to-face training sessions at the CTS headquarters, where educators were equipped with essential knowledge to discern the needs of students and to articulate more tailored requests for assistive technologies. During the training, teachers were introduced to the operating characteristics of the main assistive technologies for teaching and beyond. The trained teachers learned the importance of creating an educational model capable of implementing an inclusive and accessible educational process, including through the correct and appropriate use of assistive technologies, to



enable students to overcome the limitations imposed by their disability status and access educational content and school life inclusively.

Each academic year, an allocation of approximately 12 hours of direct training ensured through preparatory grounding. Post-training, educators received dedicated support in developing personalized educational projects for their students; to facilitate nuanced and efficacious assistance in this domain, around 30 hours of support per academic year were provisioned.

The training provided, through the individual counters and group training sessions, has reached, in the three-year period 2021/22 - 2022/23 - 2023/24, about 300 teachers. Given that each teacher follows at least one student, it can be asserted that the training has indirectly reached at least 300 students, and it can be assumed that this number grows where trained teachers follow two or more students.

### Results

The data analysis conducted revealed a discernible decrease in the number of requests for generalist computing devices, including computers and tablets, reducing from 92 during the 2021-2022 academic year to 70 in the 2023-2024 period. The following Figure 1 provides a graphical representation of this trend.

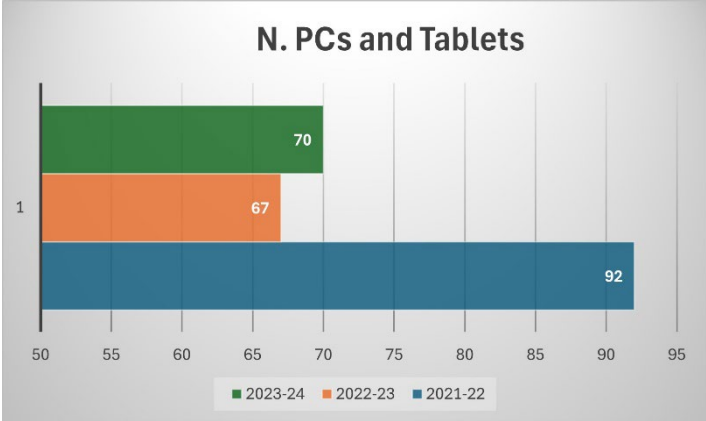


Figure 7-1 Trends in requests for generalist computing devices

In parallel, there was a notable increment in the requests for specialized assistive technologies, escalating from 70 to 88 within the same timeframe. The following Figure 2 gives a description of this trend.

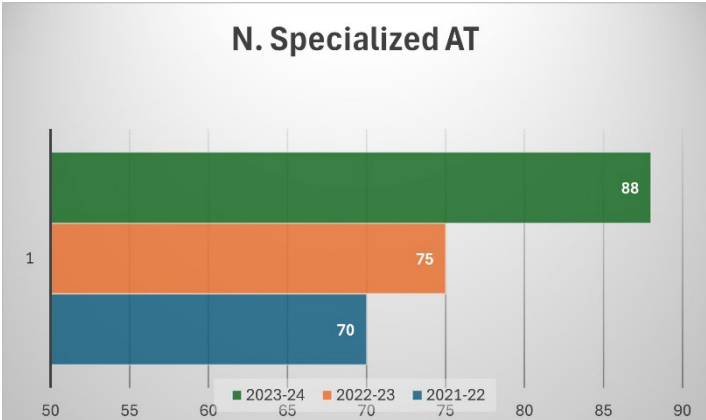


Figure 7-2: Trends in requests for specialized assistive technologies

This shift significantly influenced the average cost associated with each request, which saw an increase from 694.00 euros to 1054.00 euros per individual project.

These observed trends emerged from a comprehensive analysis of the funding data pertinent to the grant, spanning across the aforementioned three-year period.

The data analyzed were provided by the CTS Institute of Salerno province, which, as the reference school, has all the data on the projects submitted, with the measure "Sussidi" Grant, by schools in the area, within the three-year period examined in this study. The data tell what impact the support desks and training activities provided by the Manè Center had on the demands expressed in the projects by teachers, in terms of aids and teaching strategies.

The quantitative analysis of data pertaining to the recent cycles of the "Sussidi" Grant post interventions and submissions by educators that were subsequently ratified by the commission of the Regional School Office of Campania illuminates the critical role of the Assistance Center. This significance is observed not merely in facilitating the introduction of assistive technologies into educational frameworks and in generating conducive environments for the application of inclusive pedagogical approaches but also in guiding the selection towards aids that have, over time, demonstrated a trend towards increased specialization and suitability.

In conclusion, this research not only delineates an integrative pedagogical model for training interventions with a focus on Assistive Technologies but also implicitly aligns with the principles of Universal Design for Learning (UDL). By advocating for the strategic selection of technological aids, this study underscores the necessity of providing multiple means of engagement, representation, and action & expression - core tenets of UDL. The initiative outlined by the Manè Assistance Center, in concert with the Italian National GLIC Network and in response to the ministerial "Sussidi" Grant, exemplifies transformative practices that transcend traditional educational paradigms by fostering inclusivity and accessibility.

From the analysis of the results, the need emerges to delve into several significant inquiries for the future of inclusive pedagogy and the use of Assistive Technologies in the educational domain:

1. Personalization of Learning: How can the integration of assistive technologies into educational plans be optimized to support the individual specificities of students, in addition to effectively meeting their special educational needs?
2. Continuous Training and Updating of Educators: What training strategies and continuous updating modalities can ensure educators maintain current and comprehensive competence on the evolution of Assistive Technologies and their didactic application?
3. Impact and Outcome Measurement: What methods and tools can be developed and implemented to more precisely and quantitatively assess the effect of Assistive Technologies integration on student performance and inclusion in education?
4. Overcoming Barriers to Adopting Assistive Technologies: What are the main challenges and resistances to the adoption of assistive technologies in daily teaching practice, and how can they be addressed and overcome to ensure broad inclusion?
5. Stakeholder Collaboration: How can collaboration among the various professional figures (educators, technologists, psychologists, and other experts) involved in creating inclusive educational interventions that utilize Assistive Technologies be promoted and made more effective?

The exploration of these questions may further enrich the understanding and effectiveness of inclusive pedagogical interventions, contributing to the continuous improvement of educational processes and the enhanced recognition of the individual potentials of each student.

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