

REMOTE TEACHING FOR DEAF PUPILS DURING THE COVID-19 EMERGENCY

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ABSTRACT

The coronavirus emergency has accelerated the digitization processes of Italian schools, bringing new challenges to inclusive teaching. We present the remote teaching experience that is still in progress at the Scuola Audiofonetica in Brescia, and describe actions taken and initial results achieved. The families appreciated the school's educational choices, and from this positive experience, some good practices can be derived and shared at technological, methodological and organizational levels.

KEYWORDS

School inclusion, remote teaching, distance learning, Covid-19 emergency, deafness, accessibility, educational technology.

** Both the authors contributed to the final version of the manuscript. F.B. is the inclusion coordinator of the project*

INTRODUCTION

The evolution of digital technologies is a major turning point for deaf people—for example, for accessing public administration services, e-commerce and interpersonal relationships, especially through text chat and video chat (Barak and Sadowsky, 2008; Keating et al., 2008). The introduction of information and communication technologies (ICT) in schools is a significant step towards the personalization of learning paths and the application of active teaching methodologies. ICTs may help in offering differentiated stimuli through multimedia, providing modular and flexible contents, and supporting new teaching approaches (Hwang et al., 2015; Ibáñez and Delgado-Kloos, 2018). For deaf students, this means accessing teaching methods other than frontal lessons, even in the spirit of the Universal Design for Learning (UDL; Rose and Meyer, 2002). However, up until now, the technologies were mainly exploited either in the classroom or in a blended mode, and possible disadvantages of distance teaching were kept to a minimum.

The COVID-19 emergency in Italy led the government to cease face-to-face teaching activities from 26 February 2020 and forced schools to start totally remote educational activities. To date, the scientific literature on emergencies, with a focus on schools, is limited to organizational and health management aspects (Viner, 2020), whereas there are many experiences documented by teachers and experts in newspapers, on the Internet, and social networks.

At all levels, the debate focused on the concern of including the most fragile pupils, that is, those who belong to families lacking either adequate technological devices (digital divide), or digital skills (cultural divide), or those with learning impairments (due to disabilities or other causes). For deaf pupils, in addition, there is the risk of exclusion due to a lack of accessibility to synchronous lessons on e-learning platforms, which is already described in the literature (Martins et al., 2015).

According to the Italian Institute of Statistics (Istat, 2019), in Italy the issue of the diffusion of the technological equipment is still open: only 74.7% of households have a broadband connection, and 41.6% of Internet users exhibit low digital skills, with a significant gap between generations (only 34% of people over 65 have a broadband connection). During the emergency, many Italian children and young people lived with their grandparents because their parents were sick or busy working to face the emergency (for example, in

hospitals), or teleworking; others had to share their connections and devices with many family members, meaning that their access to tools and services was limited. The emergency clearly highlighted the country's limits in terms of technological innovation and digitalization of schools.

THE EXPERIENCE

The Scuola Audiofonetica is a private school that for the academic year 2019/20 enrolled a total of 540 pupils aged from 1 to 13 (from nursery school to first grade secondary school), of whom 87 had disabilities (57 deaf). Furthermore, 26% of deaf pupils have other associated disabilities, and 37% come from families of non-Italian origin, and therefore they have a double source of language and learning difficulties. All pupils with disabilities attend ordinary classes, with hearing classmates, according to a model that in 1974 transformed a special institute (born in 1856) into an experiment of school inclusion. The school is located in Brescia, one of the Italian towns most affected by the COVID-19 emergency.

The Audiofonetica implements its model by integrating educational and rehabilitation services (which is not common in Italy), with a psychologist, an education expert, an audiologist, an audiometrist, an inclusion coordinator, specialized teachers, communication assistants, sign language interpreters, educators, and speech therapists. The staff works to customize teaching in classes made up of 18-24 pupils, including 2 to 4 children with deafness. The laboratories (music, cognitive-operational, artistic), as well as flexible and small-group teaching methods, enable the inclusion.

Deaf people are proven to be different from each other in their cognitive styles (Marschark and Hauser, 2008): their variability depends on the degree of deafness, the language competence in the mother tongue, the prevalent type of communication (verbal language or signs), and on many other contextual factors. At the Audiofonetica, there are deaf pupils with different characteristics, from well-compensated deafness to sensory multidisability with serious language impairment: moving away from an exclusively oral approach and a ban on sign language (still a vital idea in Italy), today, the school adopts the Total Communication Approach (Jordan et al., 1976), exploiting various communication methods, such as Italian, Italian Sign Language (LIS), and non-verbal communication systems.

In such a complex context, the lockdown and the closure of schools have posed new challenges in terms of remote teaching accessibility. The Audiofonetica did not have any major projects to exploit educational technology, except for the use of a computer lab during curricular hours and the introduction (Sept. 2019) of interactive whiteboards at the first year of primary and middle school. Therefore, the teachers were not all ready for the transition to remote teaching, as in most Italian schools.

During the first weeks of the lockdown, materials and tasks were sent through the school electronic register (asynchronous mode), and individualized meetings (1:1) were started for deaf pupils, taking advantage of video call services that guarantee security, privacy, and functions such as two-way chat, screen sharing, and file exchange. In this way, it was possible to provide educational, logopedic, and psychological support to pupils and families. The teachers were invited – with training, guides, and tutorials – to produce accessible and high-quality multimedia content based on shared principles:

- exploitation of all communication channels, according to the principles of multimedia learning (Mayer, 2005);
- short audio-video lessons (maximum 8 minutes), which were modular, complete, coherent, and with adequate communication style, according to guidelines on the quality of podcasts in education (Lazzari and Betella, 2007) and to recent recommendations to plan distance learning solutions by UNESCO (2020);
- personal presence of the teachers on video to explain the sense of a task and introduce or synthesize a difficult concept, avoiding the reproduction of the typical face-to-face teaching;
- accessibility through subtitles and sign language translations, avoiding separate solutions for deaf pupils according to the UDL approach, which requires: (1) multiple means of representation of content by teachers; (2) multiple modes of expression by students; and (3) multiple stimuli to engage students (Rose and Meyer, 2002);
- use of repositories that do not ask for log-in or for the sending of data by minors.

From March, a communication and collaboration platform (Microsoft Teams) was gradually introduced (from secondary to primary schools) for the synchronous participation of students and the exchange of

materials in virtual classes. For nursery and kindergarten families, the educational path continued with the publication (on the school site and social networks) of stories accessible to all children and by sending various proposals, activities, and materials to parents for educational and recreational purposes.

In May, the school provided a total of 85 curricular and 150 individualized weekly hours in primary education (on 13 classes) through remote teaching in synchronous mode; 126 curricular and 65 individualized weekly hours in secondary school (on 7 classes); 14 weekly hours of contact with pupils with disabilities and their families in kindergarten/nursery (on 6 sections of kindergarten and 1 section of nursery); and approximately 60 weekly hours of remote speech therapy for deaf pupils.

RESULTS AND DISCUSSION

Due to the choices made and the actions undertaken, all the pupils were reached by distance teaching, and none were excluded. Before extending remote teaching to the primary school, an online questionnaire was administered to parents in order to assess their technological equipment, with respect to the emergency situation (children hosted by grandparents, devices occupied by siblings and parents in telework): 223 out of 254 answered (response rate: 87.8%), showing a high rate of availability of digital devices (85.7% have a PC, 60.5% have a tablet, 67.3% have a printer) and connections (85.2% having a landline and 39% having mobile networks). However, the emergency situation reduced the availability of devices among family members (PCs drop to 68.2%, tablets to 56.1%, and printers to 46.6%, with 4.9% having no tools at all because they are used by others) and compressed the adults' time to support the children (only 30% can guarantee assistance without limits).

While the starting situation is pretty good for most hearing students, who come from medium-high socio-economic contexts, several families of deaf pupils have disadvantaged economic backgrounds and have received support from local authorities to attend the Scuola Audiofonetica; the school provided them with PCs, tablets, and Internet connections. Experts gave technical assistance to families with poor digital skills to limit their cultural gap. Continuous contact with families enabled them to monitor every difficulty and to find solutions and adaptations. Some parents were able to directly perceive their children's efforts and difficulties in the classroom, and this generated a need for support, closeness, and strategisation; others have been able to directly experience sign language and learn certain signs from online teachers to use in the family (in Italy, there are no courses for hearing parents who want to learn sign language for communicating with their deaf children).

The situation has been continuously monitored through colloquia and interviews with the families, meetings and focus groups with the teachers, and by means of a survey among parents—the preliminary results of which show that the actions undertaken by the school have been highly appreciated by the families. As an example, among the families of secondary school pupils (63 out of 139 answers, response rate 45%), the level of satisfaction is on average 9.13/10 vs. 8.89 in 2019 (9.44 among families with children with disabilities); with reference to the lockdown period, they feel that their children received appropriate stimuli (8.83 avg; 9.44 children with disabilities) and think that the school staff has paid appropriate attention to pupils and families (8.89; 9.38). Tests to measure the impact on learning are under development and will be administered as soon as the school re-opens.

On the ground of this experience, we can conceive of remote teaching with deaf pupils on three levels: (1) technological; (2) methodological; and (3) organizational.

On a *technological level* (1), in terms of accessibility it is necessary that the digital materials (self-produced or found on the Internet) present adequate speech with clear audio and without background music, that they be subtitled and/or translated into LIS (based on the age of the pupils and the use of sign language), and that they have a correct framing of the face (eyes and mouth always clearly visible in the foreground to facilitate reading of lips and expressions) or of the signing space (that is, the area from head to waist where signs are articulated; Klima and Bellugi, 1979).

It is important that contents are accompanied by self-explanatory images (one must be able to grasp the meaning even without speech), coherent and cleaned of unnecessary decorative details, which are likely to result in high levels of extraneous cognitive load (Chandler and Sweller, 1991). Such products are useful for anticipating a topic to be treated in class or for making an effective summary (Lazzari, 2016), perhaps in a video that can be reviewed several times by the student. One of the greatest efforts for deaf pupils in the

classroom comes from the simultaneous and long-term management of different sensory stimuli (e.g. listening while taking notes, looking at the blackboard or the screen). Diversifying channels and languages is also a good solution to respond to the variability of their communication needs: for some pupils, in fact, auditory information is sufficient with minimal guidance, whereas for others, constant eye contact is mandatory. For some students, writing represents a stimulating alternative. If the poor quality of the Internet connection makes it difficult to read lips or see a translation in signs, one can take advantage of the chat function as an accessible and practical tool for the written language.

On a *methodological level* (2), it was necessary to propose activities with few variables and micro-objectives, considering the efforts to participate in a virtual classroom lesson (feel, understand, speak). Operational tasks and flipped learning, with the use of technologies, increase attention, motivation, and a sense of self-efficacy. Eventually, remote teaching requires teachers to produce multimedia with greater content customization.

On an *organizational level* (3), the importance of teamwork between teachers and assistants is evident, even more so for remote teaching, for a correct balance between generality and specificity of the educational intervention. Coordination and monitoring are fundamental both in traditional, in-person teaching and in remote teaching.

CONCLUSIONS

During the COVID-19 emergency, technologies are building a bridge of continuity among teachers, pupils, and families. Despite some difficulties, our experience shows that remote teaching with deaf pupils is possible if the school accepts the challenge and the community of practice affirms itself (Wenger, 1998), finding technical, methodological, and organizational solutions to achieve inclusion through learning.

Remote teaching during lockdown forced experimentation with different ways of conducting schooling, focusing attention on accessibility and generating new expertise among teachers and on the use of technologies. It is known that technologies alone do not improve learning processes (Hattie, 2008; Halverson and Smith, 2009): their effectiveness, even in deaf pupils' schooling, is mediated by methodological aspects, such as balancing specificity and universality, and requires strong investments in teacher training. After the first months of emergency distance teaching, the Scuola Audiofonetica appears to have exploited digital technologies to implement its educational offering, guaranteeing continuity to its educational project centred on inclusion.

After the hoped-for exit from the health emergency, this wealth of multimedia materials (more than 1500 resources generated in two months), knowledge, and good practices on technologies, accessibility, and inclusive teaching for deaf pupils must not be lost, but must be made available to the entire school community, in a perspective of networking between schools.

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REFERENCES

- Barak, A. and Sadowsky, Y., 2008. Internet use and personal empowerment of hearing-impaired adolescents. *Computers in Human Behavior*, Vol. 24, No. 5, pp. 1802-1815.
- Chandler, P. and Sweller, J., 1991. Cognitive load theory and the format of instruction. *Cognition and Instruction*, Vol. 8, No. 4, pp. 293-332.
- Halverson R. and Smith, A., 2009. How new technologies have and have not changed teaching and learning in schools. *Journal of Computing in Teacher Education*, Vol. 26, No. 2, pp. 49-54.
- Hattie, J., 2008. *Visible learning: a synthesis of over 800 meta-analyses relating to achievement*. Routledge, London, UK.

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- Hwang, G. et al., 2015. Seamless flipped learning: a mobile technology-enhanced flipped classroom with effective learning strategies. *Journal of Computers in Education*, Vol. 2, No. 4, pp. 449–473.
- Ibáñez, M.-B. and Delgado-Kloos, C., 2018. Augmented reality for STEM learning: A systematic review. *Computers & Education*, Vol. 123, pp. 109-123.
- ISTAT, 2019. *Report Cittadini e ICT – anno 2019*. Istituto Nazionale di Statistica, Roma, Italy, <https://www.istat.it/it/files/2019/12/Cittadini-e-ICT-2019.pdf>
- Jordan, I. et al., 1976. Current communication trends at programs for the deaf. *American Annals of the Deaf*, Vol. 121, No. 6, pp. 527-532.
- Keating, E. et al., 2008. Cybersign and new proximities: Impacts of new communication technologies on space and language. *Journal of Pragmatics*, Vol. 40, No. 6, pp. 1067-1081.
- Klima, E.S. and Bellugi, U., 1979. *The signs of language*. Harvard University Press, Cambridge, USA.
- Lazzari, M., 2016. Digital storytelling for inclusive education: an experience in initial teacher training. In M.B. Nunes and M. McPherson (eds.), *Proceedings of the 10th International Conference on e-Learning*, Funchal, Portugal, 1-4 July 2016, pp. 199-203.
- Lazzari, M. and Betella, A., 2007. Towards guidelines on educational podcasting quality. In Michael J. Smith, Gavriel Salvendy (eds.), *Human interface and the management of information*, Springer, Berlin, Germany, pp. 404-412.
- Marschark, M. and Hauser, P., 2008. *Deaf cognition: foundations and outcomes*. Oxford University Press, New York, USA.
- Martins, P. et al., 2015. Accessible options for deaf people in e-Learning platforms: technology solutions for Sign Language translation. *Procedia Computer Science*, Vol. 67, pp. 263-272.
- Mayer R., 2005. *The Cambridge handbook of multimedia learning*. Cambridge University Press, New York, USA.
- Rose, D. and Meyer, A., 2002. *Teaching every student in the digital age: Universal Design for Learning*. Association for Supervision and Curriculum Development, Alexandria, USA.
- UNESCO, 2020. *COVID-19: 10 Recommendations to plan distance learning solutions*. Retrieved at <https://en.unesco.org/news/covid-19-10-recommendations-plan-distance-learning-solutions>
- Viner, R. et al., 2020. School closure and management practices during coronavirus outbreaks including COVID-19: a rapid systematic review. *The Lancet Child & Adolescent Health*, Vol. 4, No. 5, pp. 397-404.
- Wenger E., 1998. *Communities of practice: Learning, meaning, and identity*. Cambridge University Press, Cambridge, UK.