THE RISK OF INEFFECTIVE INSTRUCTIONAL DESIGN BASED ON ALTERNATIVE AUGMENTATIVE COMMUNICATION: IMPLICATIONS FOR THE SCHOOL-FAMILY RELATIONSHIP IN SCHOOL INCLUSION

IL RISCHIO DI UNA PROGETTAZIONE DIDATTICA NON EFFICACE BASATA SULLA COMUNICAZIONE AUMENTATIVA ALTERNATIVA: IMPLICAZIONI PER IL RAPPORTO SCUOLA-FAMIGLIA NELL'INCLUSIONE SCOLASTICA

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ABSTRACT
This study examines the implementation of Alternative Augmentative Communication (AAC) in secondary schools. The qualitative-quantitative approach involved the administration of the Index for Inclusion and the School-Parent Communication Scale. The results support the effectiveness of AAC as a strategy to improve inclusion and the school-family relationship.

Il presente studio esamina l'implementazione della Comunicazione Aumentativa Alternativa (CAA) nella scuola secondaria di secondo grado. L'approccio quali-quantitativo ha previsto la somministrazione dell'Index for Inclusion e della School-Parent Communication Scale. I risultati supportano l'efficacia della CAA come strategia per migliorare l'inclusione e il rapporto tra scuola e famiglia.

KEYWORDS
Augmentative and Alternative Communication; Assistive Technologies; School-Family Collaboration; Teacher and Parent Training; Inclusion and Autonomy

Comunicazione aumentativa e alternativa; tecnologie assistive; collaborazione scuola-famiglia; formazione per insegnanti e genitori; inclusione e autonomia

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Introduction

Alternative Augmentative Communication (AAC) is a complex of techniques and strategies aimed at enhancing the communication of people who have difficulties with verbal expression. Augmentative alternative communication includes a range of electronic devices and specialised software for supporting and facilitating social interaction and learning for all learners with communication disabilities (Mirenda, 2003; Sumra et al., 2024; Sala, 2024; Fossa, 2025). In recent years, the use of AAC has also been implemented in secondary education institutions, although AAC is traditionally used with children, it allows students to actively participate in the educational process and express their thoughts more independently (Costantino et al., 2007; Trembath et al., 2007; Holyfield et al., 2017; Angelone & Festa, 2024). However, the adoption of assistive technologies in schools requires careful planning. It is crucial to prevent their use from compromising student autonomy and teaching effectiveness. Poor implementation, in fact, could end up amplifying communication difficulties instead of alleviating them (Light et al., 2014). Another major risk associated with the use of Augmentative and Alternative Communication (AAC) is the lack of consistency between the school and home environments. If a certain type of tool or symbol is used at school, while another is adopted at home, the child or adolescent may experience difficulties, hindering smooth and continuous learning. The information used in AAC must be uniform and consistent for the person to learn effectively and efficiently (Mehr, Danielle L, 2017). It is important that parents and teachers are also trained in the effective use of AAC. Indeed, the use of certain devices requires adequate training for proper use both at school and at home. If educators are not adequately trained or up-to-date on the latest methodologies, or if parents do not receive the support they need, the effectiveness of Augmentative Alternative Communication (AAC) can decrease significantly (Meder et al., 2015).

Furthermore, inadequate support can lead to feelings of frustration for both parents and teachers, negatively affecting the child's involvement and motivation. Furthermore, unrealistic expectations may be created in an attempt to promote autonomy and social inclusion. It is important to remember that AAC is not a miracle solution and that progress may take longer than one would hope. Often, significant results have to wait and this may generate frustration in the student and his/her family members, thus undermining confidence in the potential of AAC (Morin et al., 2018). The collaboration that must bind school and family is crucial:

an effective relationship and continuous dialogue are essential to monitor students' progress, ensure the consistency of the methods adopted and support their growth (Epstein, 2011; Christenson & Sheridan, 2021). Creating a supportive environment is indeed essential: it is crucial that both at school and at home a context is established in which Augmentative Alternative Communication (AAC) is used naturally and consistently. This enables the child to actively participate in daily conversations and activities. In this way, not only is communication learning promoted, but also a strong sense of inclusion and belonging (Galdieri, 2022; Crespi, 2025).

1. Tools and Methods

1.1 Participants

The research was conducted in a secondary school, involving 120 students with communication disabilities, divided into two groups: an experimental group of 60 students and a control group of 60 students. The research participants were selected according to the following criteria:

1. Diagnosis of Communicative Disabilities: Students had to have a documented communicative disability, which included:
- Motor disabilities that affect communication;
- Autism spectrum disorders (ASD) with communication difficulties;
- Cognitive difficulties affecting the ability to communicate verbally and non-verbally.
2. Age of Students: Students had to be between the ages of 14 and 17, to ensure consistency in educational intervention and assessment methods.

The students, aged between 14 and 17, were supported in their learning through the use of assistive technologies, such as tablets, speech synthesis software and symbol-based communication devices. Parents of the students were also involved to collect feedback on their level of involvement and perception of the effectiveness of AAC.

For the experimental group, interventions based on the use of AAC were used, while traditional educational methods without the use of assistive technology were adopted for the control group. The qualitative approach included semi-structured interviews with teachers, parents and students to understand experiences and

opinions on the use of AAC. The quantitative approach used Booth and Ainscow's (2002) Index for Inclusion to measure school inclusiveness and Epstein & Sheldon's (2002) School-Parent Communication Scale (SPCS) to assess the quality of communication between school and family. This combined approach provided a comprehensive view of the effects of AAC in school inclusiveness, both in terms of active student participation and school-family interaction. The importance of family involvement in school inclusion is supported by studies highlighting its benefits (Llevot-Calvet, N., & Bernad-Cavero, O., 2024; Pileri, A., 2017).

1.2 Tools

The collected data were analysed using SPSS (Statistical Package for the Social Sciences) software. A comparative analysis was conducted between the experimental group and the control group to assess the effectiveness of the intervention, using independent samples t-tests to compare the mean scores obtained from the Index for Inclusion and the School-Parent Communication Scale (SPCS).

The following issues were examined: (1) students‘ active participation in school activities, (2) improved access to educational resources, (3) the quality of communication between school and family, and (4) parents’ satisfaction with their children's school involvement.

To measure the inclusiveness of the school environment, Booth and Ainscow's (2002) Index for Inclusion was used, an instrument that analyses the presence of barriers to access, participation and learning for students with disabilities. This tool was chosen for its ability to analyse inclusiveness in a multidimensional way, considering various aspects such as active participation in school activities, individual support and access to educational resources (Booth & Ainscow, 2002). In order to measure the quality and frequency of communication between school and family, Epstein & Sheldon's (2002) School-Parent Communication Scale (SPCS) was used, which provides an assessment of the modalities and degree of interaction between teachers and parents, considering variables such as the frequency of meetings, the type of communication (formal/informal) and parents' satisfaction with involvement in educational decisions (Epstein & Sheldon, 2002).

2 Activities

The project included a number of activities focusing on the use of assistive technology, with more students and teachers involved than in the initial phase. A key activity was 'CAA-supported peer collaboration', which is based on the peer tutoring approach, a method that has been shown to improve the social and academic inclusion of students with communication difficulties by stimulating their autonomy and facilitating communication (Cooke & Pitre, 2013). Teachers were trained in the use of electronic devices and AAC software, with practical sessions covering the use of communication tables, speech synthesis programmes and symbolic communication apps. Each student received individual support according to their communication needs. In parallel, regular meetings between teachers and families were organised to discuss student progress, address difficulties and adapt teaching strategies based on the feedback received (Cooke & Pitre, 2013).

2.1 Aims

- Promoting inclusion through peer support: Facilitating social interaction and active participation of students with communication difficulties through the support of classmates;
- Strengthening the use of AAC: Using AAC as a tool to support communication, enabling learners with communication disabilities to express themselves more autonomously and integrated in the school context;
- Supporting self-efficacy and motivation: Increasing the self-efficacy of students with communication difficulties through tutoring and mutual support activities.

2.2 Phases of the activity

1. Selection of Tutors and Students: teachers select 60 tutor students and 60 students with communication difficulties. Each tutor is matched with a student with difficulties, taking into account individual needs and appropriate communication and social skills (Greenwood et al., 1986);
2. Initial training: tutors receive training in the use of AAC, focusing on symbols, speech synthesis devices and symbolic communication apps. The training also includes guidance on how to develop empathic, patient and

respectful communication, emphasising the importance of creating a positive and inclusive environment;

3. Development of tutoring: tutors collaborate with their peers in group teaching activities, such as class discussions, reading, problem solving and presentations. Students with communication difficulties use AAC to actively participate, while tutors offer support in the use of communicative tools (Schlosser et al., 2008);
4. Reflection and feedback: at the end of each tutoring session, tutors and students reflect on the experience, discussing strengths and areas for improvement. Tutors provide constructive feedback, while students with communication difficulties share emotions and opinions about the process, promoting mutual communication and self-awareness (Johnson et al., 2009);
5. School-family integration: parents of students with communication difficulties are involved regularly to discuss their children's progress and receive suggestions on how to use AAC also at home, ensuring educational continuity between school and family (Hoover-Dempsey et al., 1997).

2.3 Expected Outcomes:

- Improved communication and autonomy: Students with communication difficulties will have more opportunities to express themselves independently and interact with peers, thanks to the support of AAC;
- Increased participation and inclusion: Students will feel more included in the class group, improving participation in school and social activities;
- Benefits for tutors: Tutors will develop communication skills, empathy and awareness of the difficulties of others, as well as strengthen their support role;
- Improved school-family relations: Parents will see an improvement in their children's involvement at school, facilitating continuous communication between home and school.

3 Quantitative results

Quantitative results were analysed using scores from the Index for Inclusion (Booth & Ainscow, 2002) and the School-Parent Communication Scale (SPCS) (Epstein & Sheldon, 2002). Environmental inclusion data showed a significant improvement in the experimental group compared to the control group, with a 35% increase in active participation in school activities, improved access to teaching resources and a reduction in perceived barriers. The teachers expressed a high level of satisfaction with individual support, with 70% satisfaction in the experimental group compared to 50% in the control group. The increase in the quality of communication between school and family was more pronounced in the experimental group, with a 40% increase in SPCS scores, compared to 20% in the control group (Table 1).

Topic	Experimental Group (%)	Control Group (%)	Difference (%)
Active participation in school activities	35%	-	35%
Improved access to educational resources	35%	-	35%
Reducing perceived barriers	35%	-	35%
Satisfaction with individual support	70%	50%	20%
Improving the quality of school-family communication	40%	20%	20%

Table 1. Improvement percentages with differences between experimental and control group

4. Qualitative Results

The qualitative analysis was conducted using a thematic analysis approach, which enabled the identification, analysis and interpretation of themes emerging from the data collected through interviews with teachers, students and parents. The analysis was supported using the qualitative analysis software NVivo, which facilitated the process of coding and categorising the data. The first step in the analysis was to enter the transcripts of the interviews into the software, which enabled the data to be organised and managed in a systematic way. Next, a coding phase was carried out, in which significant passages from the interviews were identified and assigned codes. The codes were words or phrases that concisely described the main concepts that emerged from the data. These codes were then grouped into thematic categories, based on their similarity or relationship to certain aspects of the interviewees' experience. The thematic categories were then analysed to identify the main emerging themes, such as improving active student participation, social inclusion, the impact of the use of Augmentative and Alternative Communication (AAC) and parental involvement. Interviews with teachers, students and parents revealed significant differences between the experimental and control group. Teachers in the experimental group noticed an increase in active student participation, especially during interactive teaching activities. Here, the use of Augmentative and Alternative Communication (AAC) played a key role in making the students more autonomous and involved in their learning. They observed that, compared to the control group, students in the experimental group were more able to express their opinions, ask questions and participate in class discussions, thus breaking down communication barriers that previously limited their interaction. This phenomenon was less evident in the control group, where the traditional educational approach did not promote similar inclusion for students with communication disabilities. Parents in the experimental group noticed an improvement in their understanding of their children's schooling. Many of them pointed out that the use of AAC made their children's educational progress clearer and more understandable, facilitating smoother communication with teachers and a better understanding of difficulties and successes. They felt more involved in the educational process, actively participating in setting goals and monitoring progress. On the contrary, in the control group, parental involvement was more limited and not always supported by tools for effective communication. In the experimental group, an improvement in social interactions between the students was observed;

more empathy and support. Students with communication disabilities were also included in group activities, thanks to the availability offered by AAC, through which they were able to express themselves and participate in social dynamics. AAC fosters an inclusive environment in which social skills bring well-being to the students; in the control group there was less social cohesion and more difficulty in active participation in social interactions. Teachers noted that in the control group students tended to social isolation due to communication barriers. The findings are in line with studies in the literature confirming that social inclusion and peer interaction underpin the success of students with disabilities (Booth & Ainscow, 2002; Hornby, 2015). Furthermore, the active involvement of families, supported by clearer and more accessible communication, has a direct impact on students' motivation and academic performance (Epstein, 2011). The use of AAC, therefore, not only improves access to education, but also fosters a more empathetic and supportive learning environment that promotes more active and inclusive participation.

5. Discussion

The research results suggested that the use of Alternative Augmentative Communication (AAC) had a significant impact in improving social and school inclusion. Differences between the experimental and control group were evident, with superior results in terms of participation, quality of communication and school-family involvement in the experimental group. These results support the hypothesis that assistive technologies can be effective in promoting the social and academic inclusion of students with communication difficulties, as indicated by numerous studies (Alsolami, 2022; Sumra et al., 2024). School and social activities were supported by the use of AAC, allowing all students to participate. In addition, through the use of AAC, the school-family relationship became more cohesive, contributing to student improvement (Light et al., 2014). In the control group, students did not show as much progress, confirming that the adoption of assistive technologies, without adequate support and training, is not sufficient to achieve significant changes (Romski & Hoch, 2004). Indeed, the data suggest that, in addition to the use of AAC, targeted and ongoing training for teachers and families should be implemented (Wendt et al., 2019). In our study, the experimental group using AAC showed a significant improvement in active participation during teaching activities, particularly interactive ones. Teachers noticed that students were able to

express themselves more easily, asking questions and participating in discussions, thus overcoming communication difficulties that would otherwise have limited their interaction. This is in line with McNaughton and Light (2014), who point out that the use of AAC can break down communication barriers, improving both social and academic interaction. Another important issue to consider is how social interactions between students in the experimental group improved. Students with communication disabilities appeared to be less isolated and more involved in group activities, which fostered greater empathy between peers and mutual support. This is in line with Hornby (2015), who highlights how socialisation and emotional support among peers are crucial for the educational success of students with communication difficulties. Furthermore, the findings align with studies that suggest that social inclusion can improve students' well-being and motivation, leading to positive effects on learning and academic performance (Booth & Ainscow, 2002). Another significant aspect is the improved parental involvement in the experimental group. Parents noted that CAA made their children's school progress clearer, facilitated more open communication with teachers and improved their understanding of school progress and difficulties. These results are in line with findings in the literature, which emphasise the importance of active family involvement in the educational process, as good communication between school and family can have a positive impact on students' academic success (Epstein, 2011). However, the results also show that the effectiveness of AAC is linked to adequate training of teachers and families. In the control group, where no structured training support was provided, progress was more limited. These results confirm Romski and Hoch's (2004) assertion that the adoption of assistive technologies must be accompanied by continuous training to be truly effective. Similarly, Wendt et al. (2019) highlight that teacher training is crucial to ensure proper implementation of assistive technologies. This study emphasises how crucial it is to have an educational plan that is both integrated and personalised. It is essential that there is a constant and dynamic collaboration between school, family and specialists. In short, the comparison between the experimental and control group highlighted the concrete benefits of using AAC but also highlighted the importance of careful planning and continuous support. Only in this way can we ensure that assistive technologies are truly effective and adapted to the specific needs of each student (Zangari, 2012).

Conclusions

The project demonstrated that in secondary schools through the use of AAC there can be improvements in social inclusion, schooling and the school-family relationship. The data collected suggest that, although assistive technologies can be extremely useful, their effectiveness depends on adequate teacher training and continuous adaptation of the tools to the individual needs of students, as stated by Mirenda (2003). AAC should not be seen as a substitute for existing educational practices, but as a complement that can enhance the strategies already in place, thus improving access and participation for all learners (Zangari, 2012). Furthermore, research has shown that the active involvement of families is crucial to the success of educational interventions, as highlighted by Epstein (2011). An effective collaboration between school and family must go beyond sporadic communication and become an ongoing dialogue that allows for monitoring progress, addressing difficulties and ensuring consistency in practices. This systematic and participative approach requires that all actors involved in education, including teachers, families and specialists, are an integral part of the educational process. Finally, it is crucial that schools adopt an integrated approach, providing continuous training in the use of assistive technology and ensuring ongoing support for teachers and families. Without adequate support and continuous development of educational practices, the effectiveness of Augmentative and Alternative Communication (AAC) may be limited (Romski & Hoch, 2004). In conclusion, research suggests that a well-planned implementation of AAC, supported by ongoing training and school-family collaboration, can have a significant impact on the school inclusion of students with communication difficulties, creating a more equitable, participatory educational environment adapted to the needs of each student.

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