University of Messina

ISSN 2612-4033

Journal of Clinical & Developmental Psychology

Journal homepage: http://cab.unime.it/journals/index.php/JCDP/index

Improving and Generalizing Social Skills of Three Adult Colleagues with Intellectual Disability Diagnosis through a Telehealth Intervention

Tiozzo Brasiola G.,[1], Iacomini S.[2]

[1] University of Parma, Italy
[2] Tice Cooperativa Sociale, Piacenza, Italy

ABSTRACT

Background: For people with disabilities, employment is of fundamental importance as a tool for self-empowerment, enabling the development of autonomy and self-determination processes. When teaching a job, in addition to technical skills, it is essential to consider transversal competencies, commonly referred to as "soft skills," which encompass personal qualities, attitudes, and relational abilities. The present study evaluated whether specific social skills, taught within the context of colleague relationships in a workplace environment through video modeling and role-playing in telehealth, could also be generalized to a group chat setting.
Methods: The participants in this study were three adult males aged between 25 and 35, diagnosed with moderate or mild intellectual disability according to the DSM-5 diagnostic criteria. They had well-established autonomy skills and uncompromised communication. However, they exhibited difficulties in social interactions and cooperation with colleagues. This research used a Multiple Baseline across Behaviors experimental design. The first dependent variable was the percentage of spontaneous interactions, measured within a thirty-minute interval, occurring within a group chat where the participants were present. The second dependent variable was the percentage of help requests, measured within a thirty-minute interval, in the group chat. The intervention consisted of using video modeling and role-playing through an online platform.
Results: The collected data demonstrate the effectiveness of the teaching procedures, which enabled the participants to increase and generalize the targeted social skills within a chat, an alternative tool for socialization and contact.
Conclusions: The success demonstrated by video modeling and role-playing procedures in promoting interactions and cooperation with colleagues suggests that these methods could effectively teach soft skills necessary for integrating individuals with disabilities into the workplace.

Keywords: Social skills; Intellectual Disability; Telehealth; Modeling; Role-Playing

* *Corresponding author*: Giorgia Tiozzo Brasiola, University of Parma, Borgo Carissimi 10-12, Parma, Italy
E-mail address: giorgiatiozzob@gmail.com

https://doi.org/10.13129/2612-4033/0110-5068

Introduction

Having a job allows individuals to construct their identity and engage in relationships with others (Akkerman et al., 2014).

For people with disabilities, employment is fundamentally meaningful as a tool for self-empowerment. It enables the development of autonomy and self-determination processes, thus becoming an opportunity for personal growth, maturation, and the formation of one's identity.

Indeed, through employment, people with disabilities can build a socially significant role and create opportunities for social integration (Akkerman, Jansen, Kef, & Meininger, 2016). However, these individuals often face limited opportunities to express their professional interests and are frequently excluded from the competitive labor market (Dotson, Richman, Abby, Thompson, & Plotner, 2013). This issue serves as a reminder that, for people with disabilities, the belief that participation in the workforce allows them to perceive themselves as vital and constructive members of society remains crucial (Ginevra et al., 2016).

The current socioeconomic crisis seems to have significant repercussions, particularly for vulnerable groups, such as individuals with disabilities, who experience fewer opportunities and more significant difficulties in accessing the labor market (Ginevra et al., 2016).

Professionals working to support the empowerment of people with disabilities have the responsibility to assist them in constructing a personal and professional identity, avoiding standardized approaches to counseling and/or last-minute job placements that fail to consider individual characteristics and aspirations (Nota, Ferrari, & Soresi, 2014).

The current socioeconomic context continues to foster standardized employment integration methods, heavily oriented towards diagnosis, job access requirements, and adaptability to work environments. As reported in the reference document, Entrecomp (Bacigalupo et al., 2016) argues that developing entrepreneurial capacity in European citizens and organizations has been a key objective of EU and member state policies for many years. In fact, over the last few decades, some socially significant political and legislative changes have contributed to raising awareness about the possibility of acquiring new skills and knowledge aimed at promoting an entrepreneurial culture and more inclusive job opportunities for people with disabilities (Bacigalupo et al., 2016; Dotson et al., 2013).

Bacigalupo and colleagues (2016) classify competencies into three categories: (a) fundamental or instrumental competencies related to basic knowledge acquired through general education (e.g., reading and writing skills, oral communication); (b) specific or technical competencies, which refer to technical aspects directly related to employment; (c) general or transversal competences, related to behaviors and attitudes common across various occupations, such as teamwork, planning, and negotiation skills.

Studies on teaching job skills have revealed that behavioral intervention techniques and technological aids can enhance specific job skills, including autonomy, confidence, time management, and organizational abilities (Dotson et al., 2013; Wehman et al., 2016). However, most studies focus on strategies for teaching technical and professional skills, giving less attention to transversal competencies and the role of the environment in supporting these skills (Dotson et al., 2013).

However, some encouraging results regarding the use of behavioral training and technological tools to learn specific job skills have emerged (Allen, Wallace, Greene, Bowen, & Burke, 2010; Bennett, Brady, Scott, Dukes, & Frain, 2010; Bennett, Ramasamy, & Honsberger, 2013; Burke, Allen, Howard, Downey, Matz, & Bowen, 2013; Burke, Andersen, Bowen, Howard, & Allen, 2010; Hill, Belcher, & Brigman, 2013; Lattimore, Parson, & Reid, 2006, 2008). Individuals with neurodevelopmental disorders have shown increased independence in their new jobs and have maintained employment for extended periods (Hill et al., 2013; Wehman et al., 2016).

In addition to technical skills, it is essential to consider transversal competencies, more commonly referred to by their English equivalent, "soft skills," which include personal qualities, attitudes, and relational abilities. Experts categorize these competencies into broad categories, including cognitive (e.g., problem-solving, analysis, and synthesis), relational (e.g., negotiation, collaboration, and customer orientation), execution (e.g., proactivity and results orientation), and managerial (e.g., leadership and delegation skills).

According to Casner-Lotto and Barrington (2006), companies increasingly seek soft competencies over academic skills, which are essential for employees. The findings also indicate that younger employees often lack transversal communication, teamwork, cooperation, and problem-solving competencies. However, in the last two decades, few studies have been conducted on training students with disabilities in soft skills (Agran et al., 2016).

Recently, Clark et al. (2019) investigated the effects of the UPGRADE Your Performance program on the acquisition of transversal competencies in students with disabilities, both in school and work environments. The results indicated that all students improved soft skills and generalized these competencies within local workplaces, demonstrating good long-term performance maintenance (Clark et al., 2019). A study conducted by Lu et al. (2023) highlighted that a lack of soft skills is a significant factor contributing to unemployment and underemployment among young adults with disabilities. The findings emphasized that targeted training in employment-related soft skills can equip these individuals with the abilities needed for success in the workplace. Additionally, the research emphasized the importance of developing essential soft skills, including problem-solving, effective communication, adaptability, and teamwork, which are crucial for excelling in a wide range of professional settings.

Individuals can improve their soft skills by training their ability to relate to others and colleagues. For example, knowing how to listen, ask for help, and solve problems cooperatively are key elements of good relationships with colleagues, and in turn, contribute to the adequate performance of a workgroup (Park et al., 2020).

The ASSET program (Assistive Soft Skills and Employment Training), as described in the text, focuses on enhancing essential social skills for the workplace, including communication, attitude, teamwork, networking, problem-solving, critical thinking, and professionalism. This intervention was designed for individuals with high-functioning neurodevelopmental disorders, as demonstrated by the study of Sung et al. (2018), which showed significant improvements in social skills and reductions in anxiety and depressive symptoms among the participants. The program utilizes various teaching methodologies, including instructions, modeling, role-playing, and feedback. Mastam and Zaharudin (2024) conducted a systematic review that revealed how personalized and varied learning strategies effectively address each student's unique needs and strengths. By implementing robust and inclusive systems, educators empower students with disabilities to excel and make meaningful contributions across all aspects of life.

Researchers have successfully employed the modeling approach (i.e., learning by imitation) to teach social behaviors such as friendship and self-control. It has proven to be particularly effective when accompanied by practical exercises. On the other hand, role-playing can be a valuable tool for modifying social behaviors and attitudes, as well as improving problem-solving and socialization skills, as demonstrated in previous studies (Clark et al., 2019; Spivak & Shure, 1974). Strnadová et al. (2024) identified several evidence-based strategies frequently employed to teach social and emotional skills. These include visual and video supports, peer-mediated instruction, systematic teaching methods, self-management techniques, time delay, and prompting. Visual and video supports encompass tools such as graphic organizers, video-based instruction, modeling, and visual activity schedules designed to enhance understanding and skill acquisition.

The study by Park et al. (2020) examined the effectiveness of a video-modeling intervention in teaching social skills to young adults with intellectual disabilities. Despite improvements during the intervention, participants faced difficulties generalizing these skills to real-world work contexts. This result highlights the challenge of generalizing skills acquired in learning environments to different social or professional settings.

Modeling, also known as observational learning, has proven to be an effective educational tool for teaching socially beneficial behaviors such as friendship, creativity, self-control, sharing, specific cognitive skills, and even imitation itself (Bidwell & Rehfeldt, 2004; Park et al., 2020). Observational

learning is particularly effective when individuals have the opportunity to practice, which is why it is often associated with role-playing procedures.

Studies on role-playing have reported that this procedure effectively and adaptively modifies a subject's behavior. Specifically, role-playing enhances behaviors and attitudes related to social skills (Clark et al., 2019) and problem-solving skills (Bremer & Smith, 2004). Several studies advocate for the extensive use of role-playing procedures with young adults with intellectual disabilities, particularly for teaching social skills required for employment (Bremer & Smith, 2004; Holmes & Fillary, 2000).

In summary, teaching social skills through modeling and role-playing has shown promise for improving competencies necessary for the employment integration of individuals with intellectual disabilities. However, the challenge of generalizing skills across different contexts remains a crucial aspect to consider in future implementations of such programs.

The theoretical framework underpinning this study is grounded in well-established models of vocational competencies, which differentiate between technical skills and transversal or "soft" skills. These frameworks emphasize the importance of both skill types in fostering autonomy and social integration for individuals with intellectual disabilities (Casner-Lotto & Barrington, 2006; Clark et al., 2019). Additionally, learning strategies based on observational learning and active practice, such as video modeling and role-playing, have demonstrated effectiveness in teaching socially relevant behaviours (Park et al., 2020). Despite robust evidence supporting these methods, a persistent challenge in the literature is the generalization of acquired skills from controlled learning environments to real-world workplace settings. This study aims to address this gap by implementing a targeted intervention via telehealth during the COVID-19 pandemic. By doing so, it seeks to evaluate the transferability and maintenance of social skills in practical employment scenarios, thereby contributing both theoretically and practically to inclusive vocational training approaches. Specifically, our goal was to design an intervention that would help adults with mild to moderate intellectual disabilities acquire social skills through scientifically validated procedures, using video modeling and role-playing to generalize these skills, particularly in a restaurant or catering setting.

Method

Participants

Three adults, aged between 25 and 35 years, with a diagnosis of mild to moderate intellectual disability, as defined by the DSM-5 diagnostic criteria (APA, 2013), participated in the study.

Participant A was a 27-year-old male with mild intellectual disability and a verbally mediated repertoire to solve problems (Greer & Ross, 2008). He demonstrated adequate self-care and domestic

autonomy skills, as well as good abilities in accessing local services. The participant could move independently by walking, cycling, and public transportation in urban and suburban areas. However, he struggled to make new friendships and establish appropriate social relationships. We recruited Participant A for the study because of his challenges in maintaining long-term social relationships and difficulties interacting with group members when faced with tasks. The family considered it of fundamental importance to enhance the participant's social skills in the work context, as he demonstrated his ability to integrate willingness and motivation into a work environment within the food service industry. The administration of the Rosenberg Self-Esteem Scale (Rosenberg, 1965) indicated a level of self-esteem within the normal range. He also exhibited an average level of empowerment, as measured by the User Empowerment Scale (SESM) (Straticò et al., 2007). The composite score for general adaptation (GAC), derived from administering the Adaptive Behavior Assessment Scale (ABAS II) to family members (Harrison & Oakland, 2000), was below average, with a more significant deficit in the domain of social skills.

Participant B was a 33-year-old man with mild to moderate intellectual disability and a verbally mediated repertoire to solve problems (Greer & Ross, 2008). He possessed good personal and domestic autonomy skills (e.g., proper personal hygiene, appropriate clothing, and household care), but faced more significant challenges in terms of social and community autonomy. He demonstrated strong communication skills, mainly using a smartphone. Additionally, Participant B expressed a desire to communicate effectively with the group of colleagues and to interact with them outside of the work context. The Rosenberg Self-Esteem Scale (Rosenberg, 1965) administration revealed self-esteem within the normal range. He exhibited a medium to high level of empowerment, based on scores from the User Empowerment Scale (SESM) (Straticò et al., 2007). The composite score for general adaptation (GAC), derived from administering the Adaptive Behavior Assessment Scale (ABAS II) (Harrison & Oakland, 2000) to family members, was below average, with more significant deficits in the domains of social and conceptual skills (DAC and DAS).

Participant C was a 30-year-old man with mild cognitive delay and a verbally mediated repertoire to solve problems (Greer & Ross, 2008). He was independent in carrying out domestic tasks and personal care. He had good social and community autonomy skills (e.g., using money, proper street behavior, and public transportation). He had registered with the targeted employment services to find a job opportunity. Furthermore, he sought to become more autonomous and competent in communication with colleagues, aiming to establish friendly and professional relationships with them. The Rosenberg Self-Esteem Scale (Rosenberg, 1965) administration indicated low self-esteem. He displayed an average level of empowerment, as indicated by scores from the SESM (Straticò et al., 2007). The composite score for general adaptation (GAC), obtained through the ABAS II

(Harrison & Oakland, 2000) administered to family members, was below average, with a significant deficit in the domain of social skills (DAS).

At the beginning of the study, the participants were unfamiliar with one another. However, before the intervention's implementation, they attended a job-coaching workshop with a frequency of three sessions per week, totaling six hours per week. The experimenter included the participants in a WhatsApp group chat. The students exhibited difficulties in interactions both in person and within the chat. The workshop staff reported a low frequency of interactions, which were qualitatively poor, as well as avoidance behaviors related to problem-solving in the work context. The participants were selected for the present study to promote improved social and problem-solving skills in preparation for future employment integration and to generalize these skills outside the work setting, encouraging the use of smartphone applications and group chats. Table 1 presents a summary of the socio-demographic characteristics of participants.

Table 1. *Socio-demographic Characteristics of Participants*

Characteristic	Participant A	Participant B	Participant C
Age	27 years	33 years	30 years
Gender	Male	Male	Male
Diagnosis	Mild intellectual disability	Mild to moderate intellectual disability	Mild cognitive delay
Education level	High school diploma	High school diploma	Vocational qualification
Employment status	Vocational internship with local health services	Vocational internship with local health services	Vocational internship with local health services
Living arrangement	Lives with family of origin	Lives with family of origin	Lives with family of origin
Geographic area	North Italy	North Italy	North Italy

Procedure and Measures

The first dependent variable was interaction behaviour, defined as the percentage of conversation behaviours occurring about interaction opportunities, measured during 30-minute sessions within the WhatsApp group chat. The considered conversation behaviours could be either initiatory or responsive. Initiatory conversation behaviours included starting a conversation with a greeting (e.g., "Good morning, how are you?"), making relevant comments or compliments (e.g., "You did a great job organizing!"), asking questions (e.g., "How can I help you?"), using polite language (e.g., "Could you please send me a photo?"), Moreover, making personal statements or suggestions (e.g., "I would like to make my favorite dish"). Responsive conversation behaviors included responding to a greeting

by returning it, respecting turn-taking in conversation (i.e., not interrupting), accepting compliments or thanking, and apologizing.

The second dependent variable was problem-solving, defined as the percentage of help-seeking behaviors about the opportunities that arose, measured during 30-minute sessions within the WhatsApp group chat. Problem-solving behaviors included asking questions or seeking help on how to complete a task from a tutor or peer, asking to be shown how to perform a task or for a model, requesting more time to complete a task, suggesting alternatives to accomplish the task, or requesting additional materials to complete the task.

Independent Variable

The independent variables were video modeling and role-playing related to interaction and problem-solving behaviors between colleagues within a work context.

We implemented the procedures using an online platform (e.g., Zoom). In each session, we presented multiple samples (e.g., two videos and two role-plays) of the behavioral script. Nine scripts contained interaction behaviors, while five scripts contained problem-solving behaviors. Table 2 provides an example of a script used for the interaction behavior.

Table 2. *Example of a behavioral script on interaction behaviors*

Behavior	**Example**
Greeting	Good morning, Francesca! *Hi, Giorgia!*
Thanking	How are you? *I'm fine, thank you!*
Asking questions/Respecting turn-taking/Polite language	I am good, too. I slept well, and I'm ready for a new workday! *Great! Let us meet later for a break.* Okay, see you later! *Okay! Have a good day at work!*

In a teaching session, the acquisition criterion for each behavioral script was set at 90% accuracy over two multiple exemplars. Once the participants reached the criterion for the first script, we introduced progressively more complex scripts.

Since the participants' levels of functioning were not homogeneous, we conducted the intervention at a 1:1 ratio. However, they did not demonstrate the same level of comprehension of some instructions and prompts during the intervention. Therefore, we implemented the intervention in a one-on-one

educational setting to provide the most suitable prompts for each participant and ensure the correct understanding of the experimenter's instructions.

To evaluate the participants and their family members quality of life, we administered the Rosenberg Self-Esteem Scale (Rosenberg, 1965), the Italian version of the SESM (User Empowerment Scale) (Straticò et al., 2007), and the ABAS-II (Adaptive Behavior Assessment Scale) (Harrison & Oakland, 2000). The Rosenberg Self-Esteem Scale (Rosenberg, 1965) comprises ten items designed to measure self-esteem. The Rosenberg scale correlates with predictive measures of anxiety and depression (Rosenberg, 1979). The SESM (Straticò et al., 2007) measures the personal construct of empowerment based on five factors: self-efficacy and self-esteem, power, community activism, justified anger, and optimism for the future. This instrument is the Italian version of the A Consumer-constructed Scale to Measure Empowerment among Users of Mental Health Services (Rogers et al., 1997). The ABAS-II (Harrison & Oakland, 2000) assesses adaptive behavior, which measures daily living skills—what individuals can do independently. The tool assesses 10 adaptive areas, grouped into three domains: (a) conceptual: communication, academic skills, self-control; (b) social: play/leisure, socialization; (c) practical: self-care, home living, community use, health and safety, and work. We administered these instruments to describe participants' baseline profiles; however, they were not included among the study's primary outcome measures.

We conducted generalization probe sessions within the job-coaching laboratory of a vocational training school specializing in the food service industry. We collected data within the laboratory using a pen, a data collection sheet, a graph sheet, and a timer. We conducted the intervention using a computer on the Zoom platform. We used pre-recorded videos of social interactions created by the experimenter. We collected data on the video modeling and role-playing training using a pen, a data collection sheet, and a graph sheet. After the online intervention, we gathered data from the WhatsApp chat using a pen, a data collection sheet, a graph sheet, a smartphone with an internet connection, and the WhatsApp app.

Experimental Design

We employed a Multiple Baseline Across Behaviors design for each participant (Cooper et al., 2020), incorporating generalization probes before and after the intervention.

Procedures

All participants took part in the study after providing informed consent. Participants who could understand and autonomously provide consent signed the informed consent form themselves. For participants under legal guardianship, we obtained permission from their legal guardians. In both

cases, participation was voluntary, and we conducted the study in accordance with the ethical standards outlined in the Declaration of Helsinki. Before initiating the intervention, the experimenters conducted interviews with each participant in the research project. The interview assessed each participant's perception of the seven domains of Quality of Life (QoL). Experimenters asked participants to assign a score from 0 (i.e., none) to 3 (i.e., high) based on their perception of the quality of life in each domain. Then, they administered the Rosenberg Self-Esteem Scale (Rosenberg, 1965) and the Italian version of the SESM (User Empowerment Scale) (Straticò et al., 2007).

Next, the participants' families were involved, and they completed the ABAS-II (Adaptive Behavior Assessment Scale) (Harrison & Oakland, 2000).

At the beginning of the study, we administered a generalization probe to each participant involved in the experiment in a real laboratory context. In the generalization probe, the experimenter provided multiple collaborative tasks and observed each participant's interactions and help requests toward their colleagues. The experimenter asked the participants to carry out specific activities (e.g., "Set five tables for six people") and recorded the percentage of interaction and help-request behaviors in relation to the opportunities for each behavior during a 30-minute measurement session.

Subsequently, we created a group chat on the WhatsApp app with all participants. Initially, to measure a baseline for interaction and problem-solving behavior for each participant, the experimenter posted a work-related task in the chat (e.g., "Today, you need to learn to fold the napkin into a star") and observed the interaction and problem-solving behaviors among the participants in the chat (e.g., one participant could compliment a colleague for the work done, ask if anyone already knew how to do it, ask for tips on being faster, or suggest folding the napkin more simply). Baseline measurement sessions lasted 30 minutes.

Once each participant reached a stable trend in interaction behavior, the experimenter began the training for that behavior using a video modeling and role-playing procedure on an online platform. Meanwhile, the experimenter continued to collect baseline data on problem-solving behavior.

The experimenter had previously established behavioral scripts for the training, ranging from simple to complex, according to the number of behaviors included. For example, one of the behavioral scripts involved greeting and asking how the day was going. The participant saw two samples of the same behavioral script during the training. The participant watched the first video and then had to role-play the entire behavioral chain, using the experimenter as the interaction partner.

For example, the video could depict a person entering the restaurant where they worked, greeting their colleagues, and asking how everyone was doing. After watching the video, the experimenter would tell the participant, "Now we will simulate this situation: I will be the colleague inside the

restaurant, and you will arrive at work." The procedure was identical for both behavioral scripts. The experimenter presented samples once per session.

Once participants met the criterion for each behavioral script (set at 90% accuracy for two multiple exemplars in a session), the training proceeded to the next set of scripts, from the simplest to the more complex, depending on the number of behaviors involved. If the participant did not provide the correct responses during the session, the experimenter would model the proper response for the student. The same exemplars would be presented in the next session if the participant did not meet the criterion.

After completing the online intervention, the experimenter introduced a task or discussion topic in the WhatsApp group chat and measured the number of interactions during 30-minute sessions. When the number of online interactions among participants reached a stable trend, we introduced training for problem-solving behavior (with the same characteristics mentioned earlier—video modeling and role-play behavioral scripts). We conducted the same procedure for each participant in the study.

To collect data in the group chat, the experimenter would send a message with initial input about performing work-related tasks or discussing specific topics, and then observe each participant's behavior. If the participants did not respond, the experimenter would record a zero on the datasheet without intervening.

At the end of the intervention, we conducted a generalization probe in the real laboratory context for each participant. The experimenter recorded the percentage of interaction and help-request behaviors during a 30-minute session, as in the first generalization probe.

The experimenter collected the data from the generalization probes in the real laboratory context. After completing the online video modeling and role-playing training, the experimenter gathered data within the WhatsApp group chat. The experimenter used a pen and a data collection sheet containing all the operational definitions of interaction and help-seeking behaviors and collected data during 30-minute measurement sessions.

The experimenter recorded all interaction and problem-solving behaviors in the generalization probes and the WhatsApp chat and marked a plus sign (+) if the participant emitted the interaction or problem-solving behavior correctly and independently. At the end of the session, the experimenter computed the percentage of interaction and problem-solving behaviors based on all behaviors emitted by each participant and then recorded the percentage data using a graphic to compare the results across different sessions. The experimenter also noted spontaneous interaction behaviors between participants in the WhatsApp group chat outside the measurement session.

The data collection procedure described above was applied similarly for all three participants.

Interobserver Agreement

Two independent observers simultaneously collected data during the probe and intervention phases in the in vivo context and within the chat (IOA—Interobserver Agreement) (Cooper et al., 2020).

To calculate the percentage of agreement, we divided the number of agreements by the sum of agreements and disagreements and then multiplied the result by 100. Applying this method resulted in a 100% computed agreement during both the probe and training phases.

Results

The data presented in Figure 1 show that Participant A, in the first generalization probe in vivo, emitted 13% of interaction behaviors without requests for help. Regarding interaction behaviors, the participant emitted a percentage of spontaneous interactions ranging from 20% to 23%, with an average of 20.6% response instances per measurement session during the five baseline sessions.

For problem-solving behaviors, the participant emitted a percentage of spontaneous help requests ranging from 0% to 40%, with an average of 16.9% response instances per measurement session during the thirteen baseline sessions.

During the online intervention phase, Participant A exhibited a range of spontaneous interactions, with a frequency of 27% to 87%, averaging 64% response instances per measurement session in the WhatsApp chat. For the online problem-solving intervention, the participant emitted spontaneous help requests ranging from 40% to 80%, with an average of 62.8% response instances per measurement session in the chat.

At the end of the intervention, we conducted generalization probes for both dependent variables in the real-life laboratory context. Participant A showed 93% interaction behaviors and 90% help requests. The results (Figure 2) show that Participant B, in the first generalization probe in vivo, emitted 7% of interaction behaviors and no requests for help.

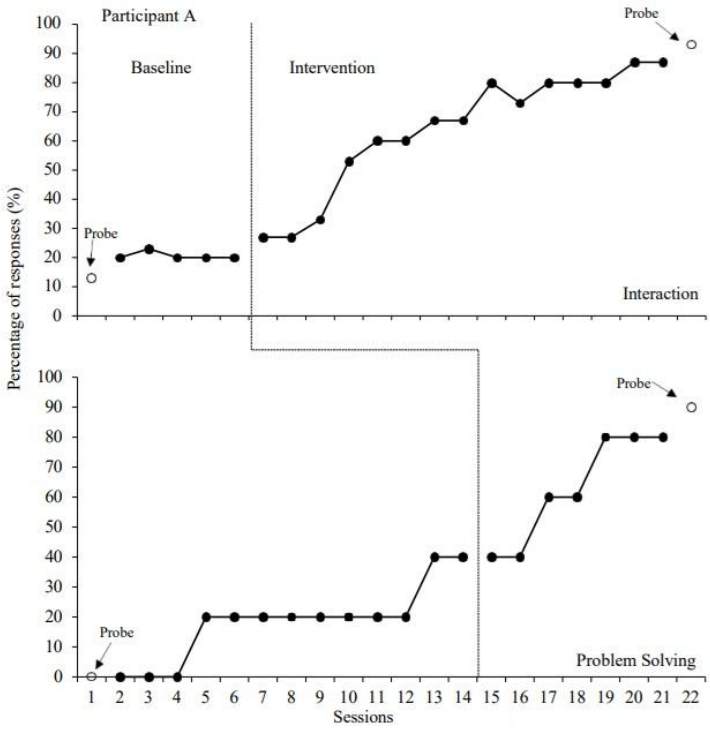

Figure 1. *Percentage of interaction and help-seeking behaviors exhibited by participant A during generalization baseline and training probes*

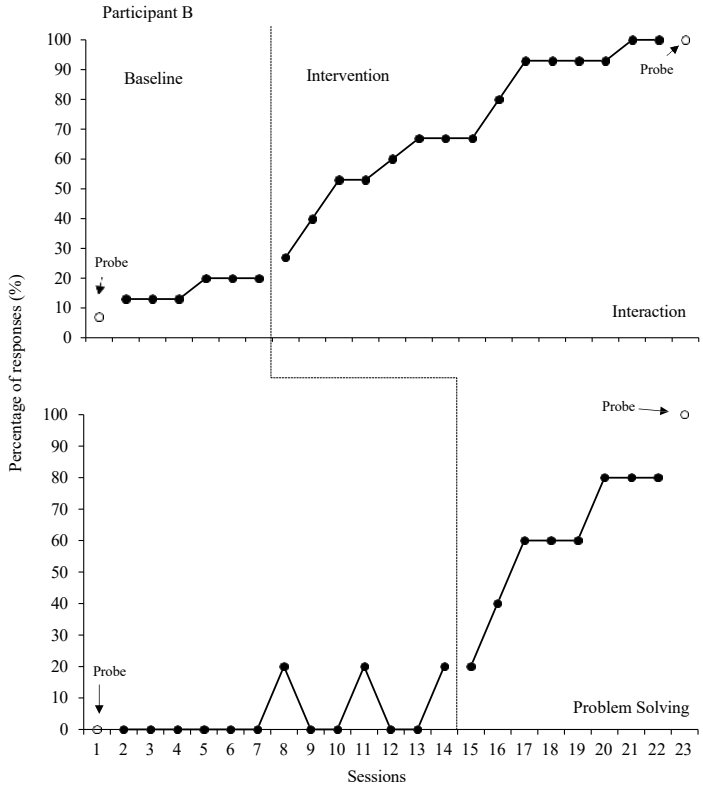

Figure 2*. Percentage of interaction and help-seeking behaviors exhibited by participant B during generalization baseline and training probes*

Participant B exhibited spontaneous interactions, ranging from 13% to 20%, with an average of 16.5 response instances per measurement session across six baseline sessions. Regarding problem-solving behaviors, the participant emitted spontaneous help requests, ranging from 0% to 20%, with an average of 4.5 response instances per measurement session across thirteen baseline sessions. After completing the online intervention on interaction behaviors, Participant B exhibited a range of spontaneous interactions, with a response rate of 27% to 100%, averaging 72% response instances per measurement session in the WhatsApp chat. The experimenter introduced problem-solving intervention in the 15th session. During the online intervention phase, spontaneous help requests ranged from 20% to 80%, with an average of 60% response instances per measurement session in the chat. At the end of the intervention, we conducted generalization probes for both dependent variables in the real-life laboratory context. Participant B showed 100% for both interaction behaviors and help requests.

Figure 3 presents the results for Participant C. In the first generalization probe, the participant showed 10% interaction behaviors and 10% help requests in the laboratory setting. The participant exhibited a percentage of spontaneous interactions ranging from 8% to 10%, with an average of 9.5% response instances per measurement session during the four baseline sessions.

Additionally, the participant emitted a percentage of spontaneous help requests ranging from 10% to 15%, with an average of 13% response instances per measurement session during the eleven baseline sessions.

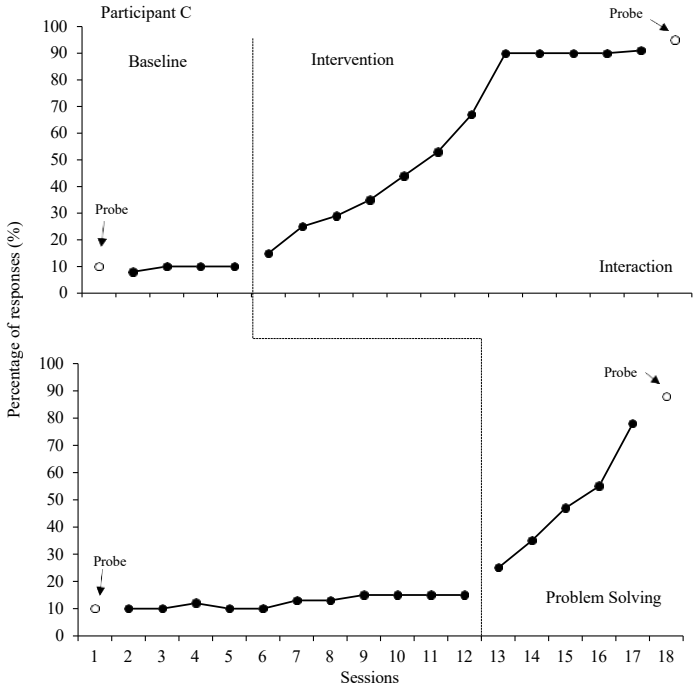

Figure 3. *Percentage of interaction and help-seeking behaviors exhibited by participant C during generalization baseline and training probes*

After completing the video modeling and role-playing intervention, the participant exhibited a percentage of spontaneous interactions ranging from 15% to 91%, with an average of 60% response instances per measurement session. We introduced the problem-solving intervention in the 13th session. During this phase, a percentage of spontaneous help requests ranging from 25% to 78% was recorded, with an average of 48% response instances per measurement session.

In the post-intervention generalization probes, Participant C showed 95% interaction behaviors and 88% help requests.

Discussion

This study assessed the generalization of a telehealth training program aimed at teaching three students with moderate and mild intellectual disabilities social skills in a workplace context using a group chat. Several studies in the literature have demonstrated the effectiveness of using technological tools to teach work-related skills (Allen et al., 2006, 2008; Bennett et al., 2010, 2013; Burke et al., 2010, 2013; Hill et al., 2013; Lattimore et al., 2006, 2008). The results of this study confirm these findings, supporting the effectiveness of teaching social skills using video modeling and role-playing procedures (Dotson et al., 2013; McGinnis et al., 1992; Wehman et al., 2016).

This study's novelty lies in implementing a remote intervention and evaluating the generalization of results in a new context—a group chat. The students demonstrated the ability to learn social interaction and problem-solving skills quickly. This finding raises essential reflections on soft skills, how contexts can support these abilities, and the identification of specific goals and strategies to achieve them. It has emerged that soft skills play a crucial role in influencing relationships and interactions within and outside of workplace settings (Bacigalupo et al., 2016).

The participants were highly motivated to use chats and online platforms, which proved to be effective and alternative tools for socializing. Throughout the research, they used the chat more frequently, discussing work-related topics and extracurricular activities, such as planning weekend leisure activities.

The teaching procedures also involved the participants' families, who expressed a desire to support their family members in finding work opportunities that aligned with the participants' goals. This underscores the potential for expanding such interventions beyond formal settings and encouraging collaboration between families and educational or vocational services, thereby promoting the maintenance and generalization of skills.

The social validity and practical implications of the findings are particularly relevant. The intervention appears to be highly replicable across educational, rehabilitative, and home environments, due to its reliance on common digital tools and structured, evidence-based teaching

strategies. Educators, therapists, and support professionals can implement the program flexibly—either remotely or in person—while adapting it to different contexts, promoting social skills through structured procedures such as video modeling and role-playing.

From a service design perspective, the intervention represents an innovative, sustainable, and transferable approach to promoting soft skills in vocational guidance and transition programs. The use of a group chat as a generalization setting exemplifies how digital tools can be effectively embedded into educational pathways to enhance peer interaction, planning, and cooperative problem-solving.

The program's flexibility and adaptability make it particularly well-suited to individualized educational and therapeutic plans. By aligning intervention goals with participants' unique needs and strengths, it contributes to enhancing autonomy and self-determination, while fostering an active social role for individuals with intellectual disabilities across different life contexts.

It would be beneficial to investigate the effectiveness of emerging technological applications supporting interventions, such as virtual reality (VR) and augmented reality (AR), which have seen significant growth in recent years, including in educational and therapeutic contexts. Notably, some studies highlight the usefulness of VR and AR in developing intervention programs to improve the social skills of individuals diagnosed with developmental deficits (Montoya-Rodríguez et al., 2022).

Another area for further investigation is the impact of the training on the participants' self-esteem; this could be measured by measuring the intervention's effects on their sense of self-empowerment and perceived quality of life.

Limit of the research and future prospective

Our research has several limitations. The design involved short intervals of behaviour measurement (e.g., thirty-minute observations) rather than continuous and simultaneous measurements. We chose this approach to reduce costs and avoid potential frustration or aversion to the task due to prolonged measurements. During each measurement, the experimenter proposed a task or discussion topic within the chat. Another limitation is that participants may have sought help or support from other family members while interacting in the chat.

Additionally, the small sample size, due to the study's case study design and practical constraints such as the specific target population and challenges related to the COVID-19 pandemic, limited our ability to expand the number of participants. While this limitation restricts the generalizability of the findings, the in-depth analysis provided valuable insights into the effectiveness and applicability of the intervention. A helpful suggestion for future research could be to consider adopting longitudinal

approaches or comparisons with other subjects not receiving interventions like the one described, in order to qualify the strength of the experiment further.

It would also be interesting to explore other relevant aspects, such as the generalization of acquired skills to settings outside the workplace or interactions with people not involved in the study. For example, one could investigate whether the participants' interaction and help-seeking behaviours also occur during public events or domestic settings, particularly concerning cooperation and family participation.

Conclusion

In conclusion, the success demonstrated by using video modeling and role-playing procedures in promoting interactions and cooperation with colleagues suggests that these methods could effectively teach the soft skills necessary for integrating individuals with disabilities into the workplace.

Fostering a network of collaboration between public and private professionals, companies, and local resources is essential, recognizing the importance of the context in supporting individuals' skills. In the future, it is desirable to continue working toward spreading a new culture and perspective regarding people with disabilities, focusing on their abilities and aspirations, and empowering them to take charge of their life projects.

Acknowledgements, Grants and Funding

This research received no specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of Interest statement

'Declarations of interest: none'.

Authors' contribution

All authors contributed to and have approved the final manuscript.

References

Agran M., Hughes C., Thoma C.A., & Scott L.A. (2016). Employment Social Skills: What Skills Are Valued? *Career Development and Transition for Exceptional Individuals, 2*, 111–120. https://doi.org/10.1177/2165143414546741

Akkerman, A., Janssen, G.C., Kef, S., & Meininger, H.P. (2014). Perspectives of Employees with Intellectual Disabilities on Themes Relevant to Their Job Satisfaction. An Explorative Study using Photovoice. *Journal of Applied Research in Intellectual Disabilities, 27*, 542-554. https://doi.org/10.1111/jar.12092

Akkerman, A., Janssen, G.C., Kef, S., & Meininger, H.P. (2016). Job Satisfaction of People With Intellectual Disabilities in Integrated and Sheltered Employment: An Exploration of The Literature. *Journal of Policy and Practice in Intellectual Disabilities, 3* (13), 205-216. https://doi.org/10.1111/jppi.12168

Allen, K. D., Wallace, D. P., Greene, D. J., Bowen, S. L., & Burke, R. V. (2010). Community-Based Vocational Instruction Using Videotaped Modeling for Young Adults with Autism Spectrum Disorders Performing in Air-Inflated Mascots. *Focus on Autism and Other Developmental Disabilities, 25*, 186–192. https://doi.org/10.1177/1088357610377318

Bacigalupo, M., Kampylis, P., Punie, Y., & Van den Brande, G. (2016). EntreComp: The Entrepreneurship Competence Framework. Luxembourg: Publication Office of the European Union. https://data.europa.eu/doi/10.2791/160811

Bennett, K., Brady, M. P., Scott, J., Dukes, C., & Frain, M. (2010). The Effects of Covert Audio Coaching on the Job Performance of Supported Employees. *Focus on Autism and Other Developmental Disabilities*, *25*, 173–185. https://doi.org/10.1177/1088357610371636

Bennett, K., Ramasamy, R., & Honsberger, T. (2013). Further Examination of Covert Audio Coaching on Improving Employment Skills among Secondary Students with Autism. *Journal of Behavioral Education*, *22*, 103–119. https://doi.org/10.1007/s10864-013-9168-2

Bidwell M. A., & Rehfeldt R. A. (2004). Using Video Modeling to Teach a Domestic Skill with an Embedded Social Skill to Adults with Severe Mental Retardation. *Behavioral Interventions*, 19, 263-274. https://doi.org/10.1002/bin.165

Bremer C.D., & Smith J. (2004). Teaching Social Skills. *Addressing Trends and Developments in Secondary Education*. National Center on Secondary Education and Transition: University of Minnesota. https://hdl.handle.net/11299/172845.

Burke, R. V., Allen, K. D., Howard, M. R., Downey, D., Matz, M. G., & Bowen, S. L. (2013). Tablet-Based Video Modeling and Prompting in the Workplace for Individuals with Autism. *Journal of Vocational Rehabilitation*, *38*, 1–14. https://doi.org/10.3233/JVR-120616

Burke, R. V., Andersen, M. N., Bowen, S. L., Howard, M. R., & Allen, K. D. (2010). Evaluation of Two Instruction Methods to Increase Employment Options for Young Adults with Autism Spectrum Disorders. *Research in Developmental Disabilities, 31*, 1223–1233. https://doi.org/10.1016/j.ridd.2010.07.023

Caldin, R., & Friso, V. (2012). Quale lavoro per le persone con disabilità, oggi, in Italia? *Studi e Ricerche*, *3*, 37-57.

Clark, K.A., Konrad, M., Test D.W. (2019). Teaching Soft Skills to Students with Disabilities with UPGRADE Your Performance. *Education and Training in Autism and Developmental Disabilities*, *54*, 41–56. https://doi.org/10.1177/17446295231163263

Cooper, J.O., Heron, T.E., & Heward, W.L. (2020). *Applied Behavior Analysis. Third Edition.* Edinburgh Gate: Pearson Education Limited.

Ginevra, M. C., Ferrari, L., Soresi, S., Nota, L., Sgaramella, M. T., Santilli, S., & Di Maggio, I. (2016). Promuovere l'Inclusione Lavorativa e Sociale. In S. Soresi, *Psicologia della Disabilità e dell'Inclusione*. Bologna: il Mulino.

Greer, R. D., & Ross, D. E. (2008). *Verbal behavior analysis: Inducing and expanding complex communication in children with severe language delays*. Boston: Allyn & Bacon.

Hill, D. A., Belcher, L., & Brigman, H. E. (2013). The Apple Ipad™ is an Innovative Employment Support for Young Adults with Autism Spectrum Disorder and Other Developmental Disabilities. *Journal of Applied Rehabilitation Counseling, 44*, 28–37. https://doi.org/10.1891/0047-2220.44.1.28

Holmes J., & Fillary R. (2000). Handling Small Talk at Work: Challenges for Workers with Intellectual Disabilities. *International Journal of Disability, Development, and Education*, *47*, 273–291. https://doi.org/10.1080/713671114

Hubbel, A. (1954). Two-person role-playing for guidance in social readjustment. *Group Psychotherapy*, *7*, 249–254.

Lattimore, L. P., Parsons, M. B., & Reid, D. H. (2006). Enhancing Jobsite Training of Supported Workers with Autism: A Reemphasis on Simulation. *Journal of Applied Behavior Analysis*, *39*, 91–102. https://doi.org/10.1901/jaba.2006.154-04

Lattimore, L. P., Parsons, M. B., & Reid, D. H. (2008). Simulation Training of Community Job Skills for Adults with Autism: A Further Analysis. *Behavior Analysis in Practice*, *1*, 24–29. https://doi.org/10.1007/BF03391717

Laugeson, E., Frankel, F., & Gantman, A. (2012). Evidence-based social skills training for adolescents with autism spectrum disorders: the UCLA PEERS Program. *Journal of Autism and Developmental Disorders, 42*, 1025–1036. https://doi.org/10.1007/s10803-011-1339-1

Laugeson, E., Frankel, F., & Mogil, C. (2009). Parent-assisted social skills training to improve friendships in teens with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *39*, 596–606. https://doi.org/10.1007/s10803-008-0664-5

Lopata, C., Thomeer, M.L., & Volker, M.A. (2008). Effectiveness of a manualized summer social treatment program for high-functioning children with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *38*, 890–904. https://doi.org/10.1007/s10803-007-0460-7

Lopata, C., Thomeer, M.L., & Volker, M.A. (2012). Feasibility and initial efficacy of a comprehensive school-based intervention for high-functioning autism spectrum disorders. *Psychology in the School*, *49*, 963–974. https://doi.org/10.1002/pits.21649

Lu, W., Oursler, J., Herrick, S.J., Gao, N., Wang, K., Beninato, J., Minor, T., Franco, S., & Jackson, S. (2023). Responding to Feedback: Employment–Related Soft Skills Training for Persons With Disability. *Journal of Applied Rehabilitation Counseling, 54,* 3, 229–247. https://doi.org/10.1891/JARC-2022-0017

Montoya-Rodriguez, M. M., De Souza Franco V., Tomás Llerena, C., Molina Cobos, F.J., Pizzarossa, S., García, A.C., & Martínez-Valderrey, V. (2022). Virtual reality and augmented reality as strategies for teaching social skills to individuals with intellectual disability: A systematic review. *Journal of Intellectual Disabilities, 27,* 6, 632-648. https://doi.org/10.1177/17446295221089147

Nota, L., Ferrari L., & Soresi, S. (2014). Vocational Designing and Career Counseling in Europe: Challenges and New Horizons. *European Psychologist*, *4*, 248 – 259. https://dx.doi.org/10.1027/1016-9040/a000189

Rathjen, D., Hiniker, A., & Rathjen E. (1976). *Incorporation of Behavioral Techniques in a Game Format to Teach Children Social Skills*. Paper presented at the Association for Advancement of Behavior Therapy, New York meeting.

Rogers E. S., Chamberlin J., Ellison M. L., & Crean T. (1979). A Consumer-Constructed Scale to Measure Empowerment Among Users of Mental Health Services. *Psychiatric Services*, *48*, 1042 – 1047. https://doi.org/10.1176/ps.48.8.1042

Ross, D.M., Ross, S.A., & Evans T.A. (1976). The modification of Extreme Social al withdrawal by Modeling with Guided Participation. *Journal of Behavior Therapy and Experimental Psychiatry*, *2*, 84 – 89. https://doi.org/10.1016/0005-7916(71)90044-9

Rosenberg, M. (1979). *Conceiving the Self*. New York: Basic Books.

Strnadová, I., Danker, J., Dowse, L., & Tso, M. (2024). Supporting students with disability to improve academic, social and emotional, self-determination, and life-skills outcomes: umbrella review of evidence-based practices. *International Journal of Inclusive Education*, *28*, 1, 1-17. https://doi.org/10.1080/13603116.2023.2221239

Sung, C., Connor, A., Chen, J., Lin, C. C., Kuo, H.J., & Chun, J. (2018). Development, feasibility and preliminary efficacy of an employment-related social skills intervention for young adults with high functioning autism. *Autism, 23*, 1542–1553. https://doi.org/10.1177/1362361318801345

Wehman, P., Brooke, V., Molinelli, A., Ham, W., Schall, C., McDonough, J., Lau, S., Seward, H., & Avellone, L. (2016). Employment for Adults With Autism Spectrum Disorders: A Retrospective Review of a Customized Employment Approach. *Research in Developmental Disabilities*, *53–54*, 61–72. https://doi.org/10.1016/j.ridd.2016.01.015