Hellenic Journal of Psychology, Vol. 14 (2017), pp. 114-138

PROBLEM-SOLVING TRAINING: AN INTERVENTION PROGRAM FOR ENHANCING INTERPERSONAL PROBLEM-SOLVING SKILLS IN CHILDREN WITH INTELLECTUAL DISABILITIES

Anastasia Vlachou, Panayiota Stavroussi, & Eleni Didaskalou
University of Thessaly, Greece

Abstract: The present study regarded an instructional problem-solving skills program that was developed for a student with intellectual disabilities within the school setting. The design and implementation processes of this educational intervention were premised on the principles of action research and unfolded around four interrelated phases, namely planning, acting, observing and reflecting. The findings indicated that the study participant was receptive to the instruction and demonstrated improved performance in recognizing, defining and formulating a problem related to social/interpersonal situations as well as in generating solution/ alternative solutions for resolving such problems. The implications resulting from the present study are discussed in terms of promoting the social inclusion of students with intellectual disabilities.

Key words: Intellectual disabilities, Interpersonal problem-solving skills, Intervention program

Address: Anastasia Vlachou, Department of Special Education, University of Thessaly, Argonafton & Filellinon, 382 21 Volos, Greece. Phone: +30 24210 74824. E-mail: anavlachou@uth.gr

INTRODUCTION

In their everyday life, children face several social problems that involve interpersonal relationships and emerge in different contexts. In the process of managing and responding competently to an interpersonal problem situation, both social behavioral and socio-cognitive abilities (including affective ones) are required (Rubin & Krasnor, 1986). Consequently, it is usually expected that the presence of difficulties in at least these two domains can significantly impede individuals from resolving flexibly and efficiently social/interpersonal problems. Children with intellectual disabilities are often struggling to make ends meet in the social arena and a vicious cycle between social behavior and social isolation is likely to be triggered. Nevertheless, these difficulties in interpersonal functioning may lead to negative social consequences, such as exclusion, rejection, and isolation, which in turn exacerbate interpersonal functioning difficulties (Vaughn, Ridley, & Cox, 1983). The existence of this process has certainly a negative impact on children's well-being, and this makes the efforts to break the cycle an even more urgent task in order the relevant quality indicators of social inclusion to be met and the probable negative long-term outcomes to be prevented.

The teaching of processes and strategies related to social cognition in children with disabilities is part of the endeavor to reduce the adverse impact that their difficulties in the socio-cognitive domain have on their social development and inclusion (Siperstein, 1992; Sukhodolsky & Butter, 2007). Interventions in social cognition, and especially those pertaining to the instruction of strategies, such as problem solving, are considered as contributing to the promotion of behaviors related to social competence in individuals with intellectual disabilities (Castles & Glass, 1986; Foxx, Kyle, Faw, & Bittle, 1989; Loumidis & Hill, 1997; Nezu, Nezu, & Arean, 1991; Sargent, Perner, Fesgen, & Cook, 2012; Siperstein, 1992; Vaughn et al., 1983). Furthermore, the skills and processes comprising the construct of social competence are among the important prerequisites for social inclusion either in school or community settings. Problem solving skills, in terms of the self-determination functional model, contribute to the promotion of self-determination which in turn is associated to positive school and post-school outcomes for individuals with disabilities (Agran, Blanchard, Wehmeyer, & Hughes, 2002; Algozzine, Browder, Karvonen, Test, & Wood, 2001; Wehmeyer & Palmer, 2003; Wehmeyer, Shogren, Zager, Smith, & Simpson, 2010). Thus, the efforts aiming at strengthening through appropriate instruction those skills and processes which foster social cognition and self-determination as well, are considered as a meaningful way for maximizing the opportunities for social inclusion.

In this perspective, systematic problem-solving training programs have been developed to promote the learning of self-directed strategies in individuals that face difficulties in coping with real-life social problems. Such strategies usually include a sequence of steps or tasks to be applied by the individual to rationally approach and solve a problem encountered. D'Zurilla and Goldfried (1971) developed a model of social problem-solving training which "was concerned with how to help individuals become more effective in solving problems encountered in their personal and social environment" (Nezu, 2004, p. 2). Within this framework, problem solving is defined as a cognitive-behavioral process that comprises four specific problem-solving skills: problem definition and formulation, generation of alternative solutions, decision making, and solution implementation and verification (D'Zurilla & Maydeu-Olivares, 1995, p. 421; D'Zurilla, Nezu, & Maydeu-Olivares, 2004; Nezu, 2004).

Another systematic approach to problem-solving training that is based on interpersonal cognitive problem solving (ICPS) theory has focused on improving a set of thinking skills, such as alternative, consequential, and means-ends thinking, for promoting social adjustment (Shure & Spivack, 1979; Shure & Spivack, 1982). A series of teacher-implemented interventions were developed based on the ICPS approach to enhance ICPS skills to children and consequently to prevent behavioral and interpersonal difficulties (Shure, 2001). Regarding this set of thinking skills or ICPS skills, Shure and Spivack (1982) noted that "these mediating skills involve not what one thinks, but how one thinks when confronted with an interpersonal problem situation" (p. 88). Both the abovementioned problem-solving training approaches place emphasis on cognitive processes rather than behavior, and the relevant models involve the teaching of processing steps or a way of thinking to help the individual to successfully resolve interpersonal problems (D'Zurilla, Nezu, & Maydeu-Olivares, 2004; Pellegrini & Urbain, 1985; Shure, 2001).

Besides the conceptual and theoretical background, another central issue in problem solving training is how to teach the component skills of the social problem solving process, especially to people with intellectual disabilities. Certainly, problem solving in the context of interpersonal relations is likely to pose difficulties to children and adolescents with intellectual disabilities (Stavroussi, Dermitzaki, & Miliadou, 2010). However, there is limited evidence regarding the effectiveness and even more the applicability in educational/school contexts of instructional procedures that aim at teaching interpersonal problem solving strategies to these students. In Edeh's (2006) cross-cultural study, a sequence of problem solving steps was taught to students with mild intellectual disabilities through two different training methods involving role-playing and modeling. The results showed that the interest-based method significantly contributed to the improvement of students' independent problem

solving performance. Likewise, a step by step procedure for solving problems was taught to adolescents with intellectual disabilities in a study conducted by Crites and Dunn (2004). The students received training through an interactive videodisc program to learn and practice a five-step procedure for solving everyday social problem situations. Brainstorming of possible solutions and discussion of the problem, role-play of solutions, as well as verbal and behavioral rehearsal by the participants were included in the training phase. Browning and Nave (1993) reported an increase in social problem-solving skills among secondary-level students with mild intellectual disabilities and learning disabilities through the use of the same interactive video-based social problem-solving curriculum. Overall, the results of these studies suggest promising outcomes for the participants with intellectual disabilities, although additional empirical evidence on the effectiveness of strategies for teaching social problem-solving skills is needed to reliably inform intervention policy in educational/school settings.

In this context, the importance of determining those teaching approaches that facilitate the learning of the sequential steps involved in the process of problem solving is highlighted. Although the selection of teaching methods and techniques relies on a variety of student-related and environmental variables, direct instruction is a key method which is usually employed for teaching social/interpersonal problem solving skills (Cote, Pierce, Higgins, Miller, Tandy, & Sparks, 2010; Pellegrini & Urbain, 1985; Sargent et al., 2012). Cote and her colleagues developed a systematic intervention to teach three problem-solving steps in middle school-age students with intellectual disabilities by employing direct instruction (Cote, 2011; Cote et al., 2010). A variety of techniques, including worksheets, storybooks, problem scenarios, discussion, flash cards, teacher modeling and role-play was used to support students' learning of the three-step sequence. The results of the study indicated that the students learned the problem-solving steps and were able to apply those in role-play situations (Cote et al., 2010).

The evidence cited above clearly indicates a growing interest, albeit the relevant studies are still relatively few, in providing instructional opportunities to students with intellectual disabilities for enhancing their problem-solving skills and thus promoting their social development in inclusive environments (Agran et al., 2002; Cote et al., 2010).

Aim of the study

Within the context outlined above, the present study focused on the instruction of a problem-solving strategy which is based on the social problem solving theoretical

framework (D'Zurilla & Maydeu-Olivares, 1995; D'Zurilla et al., 2004). Specifically, the aim of the study was to evaluate the results of the implementation of a structured program for the instruction of a stepping strategy involving the problem-solving skills which are included in the social problem solving model (D'Zurilla et al., 2004). A detailed description of the content of the program can be found in Vlachou and Stavroussi (2016). So far, the data on the implementation of this program are based on an intervention of a one-to-one format that took place within the school context. Given that the program has been developed for a student with mild intellectual disabilities, adequate adaptations of methods, techniques and materials have been employed to meet the student's strengths and weaknesses profile. In general, the rationale for developing this instructional program was mainly to provide a systematic way of teaching students with intellectual disabilities the set of skills or steps involved in the self-directed process of problem solving in social situations. Taking into account the ongoing efforts in promoting social inclusion for persons with disabilities, the described program was originally designed to address the needs of students with mild intellectual disabilities in the area of social interactions and aims at equipping them through systematic instruction with a rational and planful way to approach and independently manage interpersonal problem situations.

METHOD

Participant and setting(s)

Eddie, an 11-year old boy in the third grade of a special school, participated in this study. Eddie's IQ as measured with WISC-R fell into the range of mild intellectual disabilities (full scale IQ = 63), while his score on the "Raven Colored Progressive Matrices" was 15 (raw score). Eddie experienced double institutionalization since he lived at an Orphanage Institution and attended a special school for students with developmental disabilities. At the same time, however, he was in a transition program for his inclusion into a neighborhood general education school. For this reason, three days a week, and for two hours a day, he attended a resource room setting in which a specially designed program was implemented for supporting him in adjusting into the new schooling environment.

Participant observations at the special and general schools, semi-structured interviews with the social worker, the curator of the orphanage, the school psychologist and his special and general teachers and informal assessment measurements revealed that Eddie was a young boy who exhibited satisfactory self-

care skills such as caring for personal hygiene, clothing, preparing and eating small meals as well as maintaining –with support and supervision personal safety and self-protection. In all academic subjects, he was functioning below grade level but he liked and was good at painting and music. He had relatively good communicative skills, for instance he could initiate and maintain a conversation with appropriate gesture signs, he interpreted adequately social verbal and non-verbal information and he could express himself. Despite these strengths, he had difficulties with his interactions with peers and in expressing his feelings, managing his anger as well as solving social problems which involved interpersonal relationships. In terms of social validity, the improvement of interpersonal problem-solving skills was high as a priority in Eddie's individualized educational plan not only for his adjustment and smooth transition to the general school but for his social development in more general terms.

Intervention program

In light of the above context, the authors of this paper were involved in the design and implementation of a structured educational intervention program for supporting Eddie in improving his social problem-solving skills. For this purpose, consent was obtained from the participant's legal guardians. The setting for this study was the resource room of the public general education school as well as a specially designed place at the orphanage where children-residents could use for studying. Due to lack of existing relevant training programs, and taking into consideration the necessity of individualization, the intervention program and its evaluation was developed and implemented on the principles of action research (Gay, Mills, & Airasian, 2012). This type of methodology was selected in order to offer the opportunity to reflect upon the practices used and modify them according to the data obtained at the field – offering in that way a heuristic dimension in the research project. In fact, action research involves a group of four fundamental aspects: planning, acting, observing and reflecting. Kemmis and McTaggart (1988) highlight the dynamic complementarity of those four aspects which end up in a cycle, and ultimately in a spiral of such cycles.

A number of meetings, informal participant observations at the orphanage institution and at the schools (both special and general) and discussions with Eddie, his social worker, the school psychologists and his teachers (special and general) took place during which all the members of the action research network group discussed: (a) Eddie's needs and strengths; (b) the context's possibilities and limitations and (c) the most appropriate type of support/intervention. The action research network group ended up with a cyclical collaborative planning and reflecting network of activities, consisting of three inter-related phases that are going to be described in the results

section. Before, however, embarking into the description of the results, it is important to mention that due to space limitations the results will focus mainly on the "end product" rather than the process involved during the implementation of the action research (for an extensive analysis and thorough description of the intervention program see Vlachou & Stavroussi, 2016).

RESULTS

Action research phase 1: Initial assessment of problem-solving skills

The first phase involved the implementation of an initial problem-solving assessment procedure that was designed to ascertain the student's experience with problem solving and his ability to identify a problem and its potential solutions. For this purpose, the special education teacher administered (a) the Problem Solving Questionnaire and (b) the Recognizing and Responding to a Problem Situation assessment tools. Both measures were designed by the research team of the study based on previous relevant studies (Cote et al., 2010; D'Zurilla et al., 2004).

Specifically, the Problem Solving Questionnaire consisted of eight questions related to a problem-solving situation. It comprised the following questions: What is a "problem"? Can you think of a problem that you had lately? What did you do to solve this problem? Did you manage to solve it in the end? When was the last time that you had a problem? Did you ask for help to solve it? Who do you go to get help when you have a problem? How could someone help you with a problem that you have? The student's responses were graded on a three-level Likert-type scale (the three levels were as follows: 1- does not know; 2 - knows but not sufficiently; 3 - knows sufficiently). The duration of administering the questionnaire was approximately 15 minutes (for an extensive description of the 'Problem Solving Questionnaire', see Vlachou & Stavroussi, 2016). The data obtained from the first evaluation measurement, indicated that Eddie had a good grasp of the notion "problem" but he faced difficulties in identifying the processes involved in solving a problem. For obtaining a more accurate picture, the research team, in collaboration with the special teacher, designed and administered the "Recognizing and Responding to a Problem Situation" (RRPS) assessment tool which consisted of five short stories depicting peer interaction situations. Only three of the five stories described problem situations. In this way, the student's skill, to discriminate between the problematic and non-problematic social situations, was also assessed. Each story was followed by a picture, depicting the social interaction of the respective story, and a sequence of six questions

(see Box 1). The RRPS measurement was based on theoretical models (i.e., D'Zurilla & Goldfied, 1971; D'Zurilla et al., 2004) that conceptualize problem solving as a step by step process. On this ground, the RRPS's questions reflected a series of six consecutive steps: (1) problem recognition; (2) problem definition and formulation; (3) generation of solution; (4) generation of alternative solutions; (5) choice making; and (6) decision justification. The student's responses on the six questions were graded on a three-level Likert-type scale, that is, 1- does not know, 2 - knows but not sufficiently, 3 - knows sufficiently.

Box 1. "Recognizing and Responding to a Problem Situation" measurement

Pre- assessment									
		Does not know (1)	Knows but not sufficiently (2)			Knows sufficiently (3)			Notes
	STEPS	QUESTIONS	1st script	2nd script	3rd script (control)	4th script	5th script (control)	MEAN SCORE	
1	(problem recognition)	Is there a problem in the story?	**1** 2 3	1 2 **3**	1 2 **3**	1 2 **3**	1 2 **3**	2,6	
2	(problem definition and formulation)	What is the problem in the story?	**1** 2 3	1 2 **3**	1 2 3	1 2 **3**	1 2 3	2,3	
3	(generation of solution)	How can it be solved?	**1** 2 3	1 **2** 3	1 2 3	1 **2** 3	1 2 3	1,7	
4	(generation of alternatives)	What else could be done to solve the problem?	**1** 2 3	1 **2** 3	1 2 3	1 2 **3**	1 2 3	2,0	
5	(decision / choice making)	What is the best solution?	**1** 2 3	1 **2** 3	1 2 3	1 **2** 3	1 2 3	1,7	
6	(decision justification)	Why?	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	-	.

Given that in the RRPS the highest mean score indicating sufficient knowledge for each step/question was 3, Eddie's responses indicated:

- satisfactory performance on the first step (problem recognition) ($M = 2.6$),
- relatively satisfactory performance on the second step (identification and formulation of the problem) ($M = 2.3$), and
- non-satisfactory performance on the third (generation of solution, $M = 1.7$); the fourth (generation of alternatives, $M = 2$); and fifth steps (decision/choice making, $M = 1.7$).

The non-satisfactory performance on 'choice making' (step five) led us not to proceed on step six which involved "decision justification". However, it is important to mention

that Eddie discriminated successfully the stories that did not contain problematic situations and which acted as control stories in the measure used.

Based on the above results, the discussions we had with Eddie as well as the discussions with Eddie's teachers and his social worker, we designed an educational intervention program for enhancing interpersonal problem-solving skills. The intervention started with a familiarization process and focused on the first four problem-solving steps. The fifth and sixth steps (choice making and decision justification, respectively) were omitted due to their complexity and in order to avoid overburdening the student with many simultaneous cognitive objectives.

Action research phase 2: Familiarization with social problem-solving situations

The implementation of the second phase of the programme included six one-hour sessions with Eddie, during which a total of 18 short stories, followed by an equal number of pictures, were used. The selected stories described conflicting interactions between two children-characters and referred to the everyday life of the student (for an extensive presentation of the stories see Vlachou & Stavroussi, 2016). Each story was read aloud to the student while the respective color picture was simultaneously presented. In each session, only three of the short stories were used in order to maintain the student's interest and avoid fatigue. Additionally, during each session the teacher used a structured script which included questions assessing Eddie's level of understanding of the content of the story (e.g., 'Show me; who is Kostas?' 'What did Kostas do?') as well as problem-solution questions (i.e., 'Is there a problem here?' 'What is the problem?', 'How can this problem be solved?' etc.; for an extensive presentation of the structured script see Vlachou & Stavroussi, 2016). The teacher used a specially designed form (Box 2) for recording Eddie's responses.

The repetition of the procedure that characterises this specific phase of the programme was expected to contribute to an increased familiarization of the student with the approach taken to analysing interpersonal conflict situations, that is, the use of the four problem-solving steps. The improvement in the familiarization was assessed based on the student's reactions to the social problem-solving steps and the accuracy of his responses to the respective four questions. The success criterion to each question was 85%. At this point, however, it is important to mention that as far as the assessment of responses are concerned, no corrections were made in case of mistakes while in cases where the response was delayed over 5 seconds, probing was provided with phrases such as 'Let's think...' 'What are you thinking? For example, in the step 'What is the problem?' the probing took the form of phrases such as: 'Is everything ok?', 'What went wrong?'

Box 2. Record form for the familiarization phase

Date ..... Week ..... Session ..... Duration		1st short story	2nd short story	3rd short story	NOTES
Scoring 1 (right without probing) 3 (not know/not answer without probing) 5 (wrong with probing) 7 (other) 2 (wrong without probing) 4 (right with probing) 6 (not know/not answer with probing)					
Retrieval-Understanding	Character 1				
	Character 2				
	Plot 1				
	Plot 2				
	Need for replay	Y* N**	Y N	Y N	
Problem solving	"Is there a problem?" (problem recognition)				
	"What is the problem?" (problem definition and formulation)				
	"What can .... do?" (generation of solution)				
	"What else can .... do?" (generation of alternatives)	Number of alter/ves ***....	Number of alter/ves	Number of alter/ves	
Student's feedback					

Eddie's responses to the questions assessing retrieval and understanding of the story indicated excellent performance in identifying the characters (mean percent 98.06%), the action of the character causing the problem (mean percent 98.06%) and difficulties in understanding the action of the character experiencing/affected by the problem (mean percent 79.72%) (see Figure1). In relation to the problem-solving questions, Eddie had an accurate understanding in recognizing and defining the problem (mean percent 100% and mean percent 96.39% respectively) in all the sessions with the exception of the last session in which he achieved lower scores in defining the problem. Eddie's responses in generating a solution and generating alternative solutions were satisfactory (mean percent 97.22% and mean percent 92.78% respectively) (Figure1). The scores in generating a solution and generating

alternative solutions per session were: 2.33 for the 1st session; 2.33 for the 2nd session; 3 for the 3rd; 4 for the 4th, 4 for the 5th, and 4 for the 6th session. Overall, the mean score in generating a solution during the six sessions was 3.27, with min 2 and max 4.

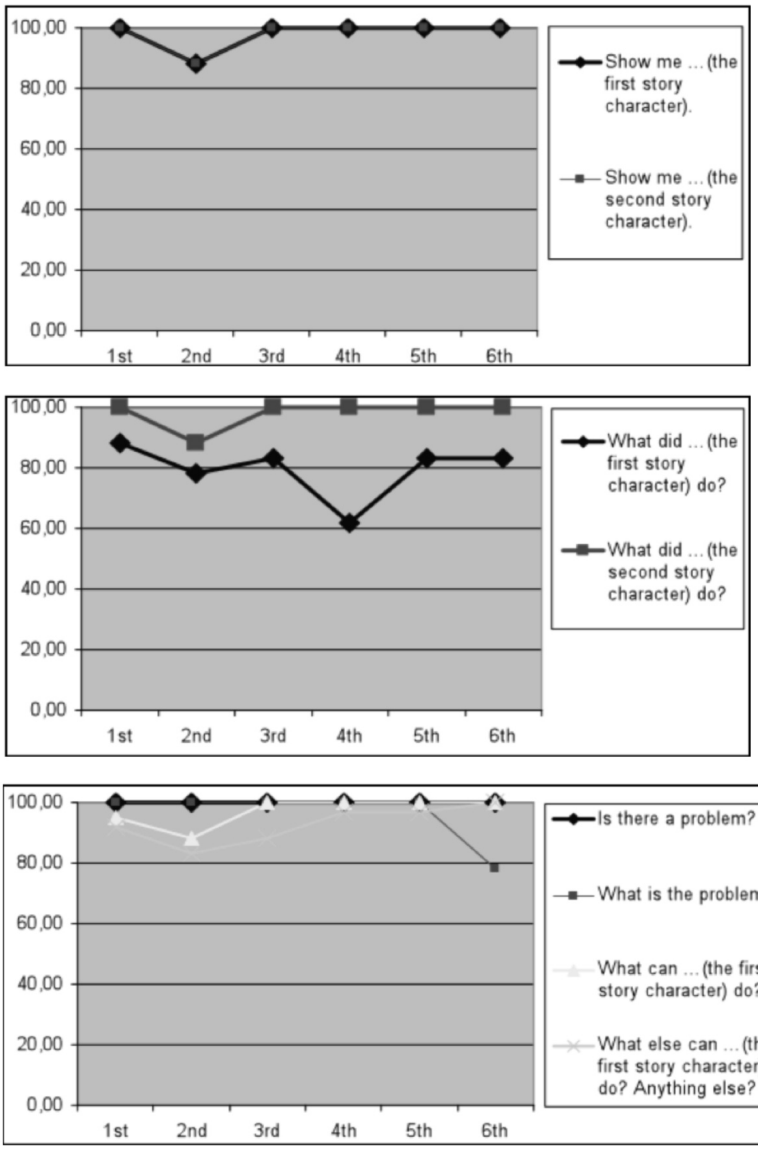


Figure 1. Percentage of responses to the familiarization actives (18 stories X 6 one-hour sessions)

Reflections on the scores and discussions with the special teacher, who implemented the familiarization activities, revealed the difficulty in the use of pictures due to their static character and the difficulty in depicting the action per se. For this reason, it was decided to construct eight new short stories with conflict situations and use colored photographs (instead of pictures) demonstrating 'real instances' of children acting the plot presented at the stories. It was also decided to implement three more sessions, using six out of the eight new stories accompanied by the colored photographs. Also in the pilot phase, the generation of alternative solutions was structured and the student was asked if he could find up to three alternative solutions. In the pilot phase it was made clear that the structured generation of solutions could be also used for measurement reasons or for establishing criteria for the correct response. The Pilot results indicated, firstly, accurate responses in identifying the characters (mean percent 100%) and the action of the character causing the problem (mean percent 100%); secondly, accurate responses in all but one sessions in understanding the action of the character experiencing/affected by the problem (mean percent 88.89%); thirdly, accurate responses in recognizing the problem and in generating solutions and alternative solutions (mean percent 100% for all the three mentioned steps) and, fourthly, satisfactory responses in defining and formulating the problem (mean percent 97.22%). Taking into consideration the student's whole satisfactory performance, in the familiarization process, we proceeded with the implementation of the next phase of the programme, which regarded the teaching of application of the four steps in the social problem-solving steps sequence, in the context of short stories.

Action research phase 3: Teaching the social problem-solving steps

The third phase of the intervention program included two related sub-objectives: (a) learning/memorizing the sequence of social problem-solving steps and (b) implementing these steps in a problem situation described in a short story. The instruction was formulated following the first level of Haring and Eaton's (1978) instructional hierarchy framework, that is, acquisition (see also Joseph & Konrad, 2009; Parker & Burns, 2014).

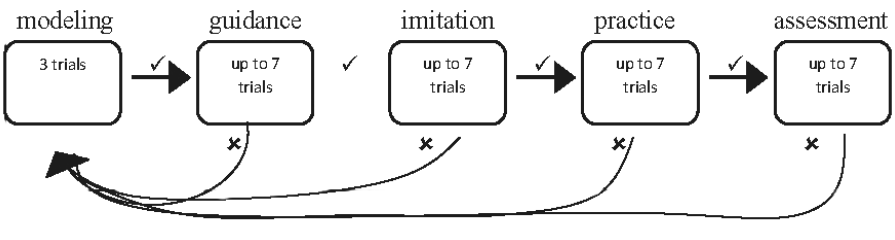
Learn/memorize the steps in a sequence

The first sub-objective was completed in a five-week period and included the following stages and instructional techniques:
Stage 1: Acquisition stage (Modeling, Guidance, Imitation, Practice, Assessment)

Stage 2: Short–term maintenance stage (Practice, Assessment)
Stage 3: Long-term maintenance stage (Practice, Assessment)

To provide a structured intervention, we created a framework according to which three trials were implemented during the modeling technique while seven trials were carried out during the remaining four techniques (see Picture 1). Keeping the student's attention was considered as a success criterion at the modeling technique. If the success criterion was met the guidance technique was applied. If the success criterion was not met, then the modeling procedure was repeated in a following session. For the remaining techniques of the acquisition stage, a success criterion of 85% of correct response was proposed (that is, six correct out of the seven responses). If the success criterion was met, the following technique was implemented each time. If not, the teacher returned to the implementation of the modeling procedure, which could take place in a following session.

Picture 1. Instructional program for the acquisition stage of the 1st sub-objective



At every session across the three stages, a specially designed protocol was filled in by the teacher with the aim of recording the student's performance and evaluation of the action (for an extensive analysis of the instructional program including the record form and the accompanied script see Vlachou & Stavroussi, 2016).

Stage 1: Acquisition stage (Modeling, Guidance, Imitation, Practice, Assessment)

During the acquisition stage, three sessions were carried out in different days within a time span of two days between each session due to failure to respond to the success criteria on the first and second session. Specifically, during the first session, Eddie met the success criteria in the modeling and guidance techniques (100%; 7correct responses out of the 7 trials and 100%; 7 correct responses out of the 7 trials respectively) but failed to reach the success criteria in the imitation technique (50%; 2 correct responses out of the 4 trials). During the second session, Eddie met the

success criteria in the modeling (100%; 3 correct responses out of the 3 trials), the guidance (100%; 6 correct responses out of the 6 trials), the imitation (85%; 6 correct responses out of the 7 trials) and the practice (85%; 6 correct responses out of the 7 trials) techniques but failed to reach the success criteria in the assessment (30%; 1 correct response out of the 3 trials) technique. It was on the third session that Eddie reached the success criteria during all five techniques; specifically, he reached 6 correct responses out of the 6 trials in Modeling, Guidance, Imitation, Practice and 6 correct responses out of the 7 trials in the Assessment technique (see Figure 2).

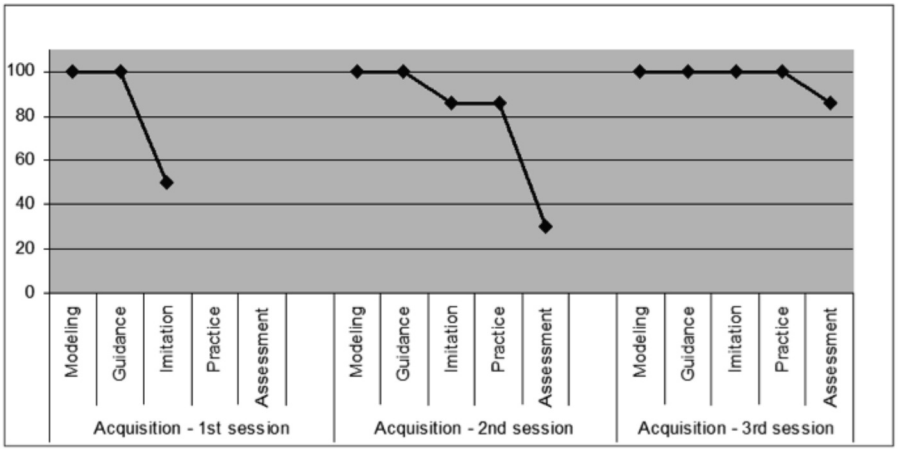


Figure 2. Results from the three sessions of the acquisition stage

After the successful completion of the social problem-solving steps, short-term and long-term maintenance assessment concerning the acquisition of the steps followed. At the same time, however, the experience from the field and the discussions with the special education teacher, who implemented the educational intervention program, revealed the necessity to minimize the number of trials at each technique in the acquisition phase so as not to overburden the student with excessive repetition(s). Thus, it was decided at the next sub-objective of the third stage to carry out five trials at each technique.

Stages 2 and 3: Short- and long-term maintenance stages (Practice, Assessment)

The short-term maintenance was conducted three days after the completion of the acquisition stage with the implementation of practice and assessment techniques. Three trials were carried out at each technique while the success criterion was set to

one hundred percent correct. The short-term maintenance stage was conducted by the special education teacher in a 15-minute session. Eddie responded successfully, reaching the success criterion at both techniques that constitute the short-term maintenance stage.

Equally successful responses were given by Eddie, one month after the completion of the acquisition activities, during the implementation of the long-term maintenance stage in which three trials were carried out at each of the two techniques (practice and assessment). The correct student response at a level of 67% was the success criterion and Eddie reached that criterion. Eddie's progress in learning and memorizing the steps provided the impetus for proceeding on the second sub-objective of Phase 3 and the last objective of the intervention program which was for Eddie to apply independently the sequence of the steps to a problem described in a short story.

Applying the steps in the context of a brief story

Specifically, during this phase of the program, Eddie was asked to apply the four steps in the context of eight stories. As the value of the repeated use of the same short stories has been recommended in previous research (Cote Sparks & Cote, 2012), the stories that were selected had also been used during the second phase of the program. However, at this stage, the stories were transferred from the third to the second person singular to facilitate Eddie's identification with the character of the story that faces a social problem.

The realization of the second sub-objective of Phase 3 included again three stages but this time lesser techniques:

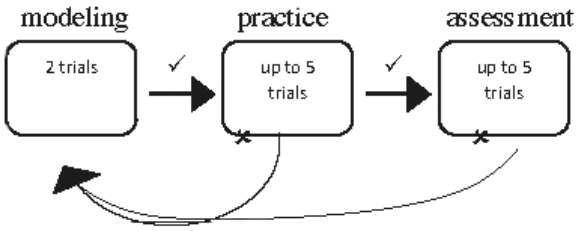
Stage 1: Acquisition stage (Modeling, Practice, Assessment)

Stage 2: Short–term maintenance stage (Assessment)

Stage 3: Generalization stage (Assessment)

Again, as above, and to provide a structured intervention, we created a framework according to which two trials were implemented during the modeling technique while five trials were carried out during the remaining four techniques (see Picture 2). Keeping the student's attention was considered as a success criterion at the modeling technique. If the success criterion was met the guidance technique was applied. If the success criterion was not met, then the modeling procedure was repeated in a following session. For the remaining techniques of the acquisition stage, a success criterion of 80% of correct response was proposed (i.e., four correct out of the five responses). If the success criterion was met, the following technique was implemented each time. If not, the teacher returned to the implementation of the modeling procedure, which could take place in a following session.

Picture 2. Instructional program for the acquisition stage of the 2nd sub-objective



At every session across the three stages, a specially designed protocol was filled in by the teacher. The aim was to record the student's performance and evaluation of the action (for an extensive analysis of the instructional program including the record form and the accompanied script see Vlachou & Stavroussi, 2016).

Stage 1: Acquisition stage (Modeling, Practice, Assessment)

The acquisition stage was completed over two sessions due to Eddie's failure to respond to the success criterion on the first session (Figure 3). Specifically, in the first session, he met the success criteria in the modeling technique but failed to reach the success criteria in the practice technique (50%; 2 correct responses out of the 4 trials). In the second session, Eddie met the success criteria in all the three techniques: the modeling (100%; 2 correct responses out of the 2 trials), the practice (80%; 4 correct

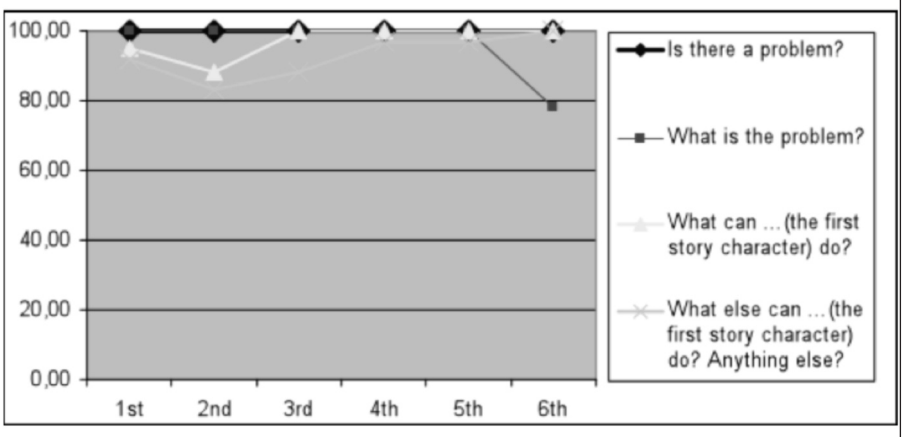


Figure 3. Results from the two sessions of the acquisition stage

responses out of the 5 trials) and the assessment (100%; 4 correct responses out of the 4 trials) techniques.

Stages 2 and 3: Short- and long-term maintenance stages (Assessment)

The program was completed after Eddie's successful responses at both the short and long- term maintenance stages of the second sub-objective of the third phase. In particular, the short-term maintenance stage was conducted in one session, three days after the completion of the acquisition stage. It included only the assessment technique in which three trials were carried out by the special education teacher while the success criterion was considered to be 67% correct student's response. Eddie responded successfully in the assessment technique (100%; 2 correct responses out of the 2 trials).

Ten days after the completion of the acquisition stage, Eddie made up three original short stories describing a conflict situation involving peers and he was asked to apply the whole sequence of the four problem-solving steps without any prompts by the teacher. Three trials were implemented, and at the generalization stage Eddie reached easily the success criterion which for the generalization stage was set at 67%.

DISCUSSION

This article reported the outcomes of an interpersonal problem-solving skills pull-out intervention program designed and implemented for a primary-school student with mild intellectual disabilities. The procedures followed for designing and carrying out this project were premised on the methodological principles and standards of action research. The findings of the study are examined within the context of previous pertinent research. The commentary of the study results emphasizes on the effectiveness of some of the core components of field-tested instructional interpersonal problem-solving skills programs for students with disabilities. The implications resulting from the evidence presented here are also discussed in terms of promoting the inclusion of students with disabilities.

The findings add weight to existing limited research evidence indicating that students with mild and moderate intellectual disabilities are receptive to individually-tailored and well-structured instruction on the acquisition of skills as well as improved performance of interpersonal problem solving (Agran et al., 2002; Cote, 2011; Glago, 2005). As the post-intervention assessment data suggest, the student participating in this study performed better in identifying problems arising amongst peers, generating

alternative solutions for resolving such problems, making decisions of optimal solutions and justifying choices. These positive results are in alignment with the outcomes of an instructional intervention on social problem solving designed by Cote and her associates (2010) and delivered by a special teacher to a group of four students with mild intellectual disabilities. The findings demonstrate that this particular group has the potential to enhance their aptitudes in mastering self-reliant processes for resolving problems encountered during peer interactions.

An alternative interpretation of the results of the study may be that there is a low prioritizing of individualized training on interpersonal problem-solving skills within the prevailing framework of educational practices of special teachers in Greece. Such low prioritizing becomes even more critical when viewed within the recent emphasis in policy advice and guidance provided to schools and teachers to enhance the self-advocacy and self-directed decision-making abilities of students with intellectual disabilities as a means of promoting their social efficacy and inclusion within mainstream educational institutions (Cote Sparks & Cote, 2012; Wehmeyer et al., 2010). The acquisition of interpersonal problem-solving skills constitutes an integral central component of self-determination and has been found to be significantly related to the individuals' social self-efficacy (Agran & Hughes, 2005; Erozkan, 2013). Building up these specific skills in students with intellectual disabilities, empowers them to exercise control over their social lives and issues that may arise with their peers at school, thereby improving adaptive coping deemed to be fundamental for learning and for an autonomous and successful adult life (Anderson & Kazantzis, 2008; Cote, 2011).

To this end, this research further endorses existing empirical evidence demonstrating that the particular training model developed by D'Zurilla and Goldfried (1971) can be beneficial for students with mild disabilities in enhancing their competence in identifying the steps of problem solving as well as maintaining and generalizing skills taught in new problem scenarios (Cote et al., 2010; Cote Sparks & Cote, 2012). Although initially constructed and used for adults with intellectual disabilities (Anderson & Kazantzis, 2008), the outcomes presented here endorse further its potential applicability to samples of children with mild disabilities. This is a truly promising development, particularly when considering that children with restricted intellectual abilities often encounter significant difficulties in establishing positive mutual interpersonal relationships with schoolmates, rendering them susceptible to experiencing social isolation and loneliness within the school context (Andreou, Didaskalou, & Vlachou, 2013; Frederickson & Furnham, 2004; Frostad & Pijl, 2007).

The positive outcomes of the intervention, highlight, along with the learning capacity of the study participant, the potential capacity for schools and teachers to

convey constructive problem-solving instruction to students with disabilities (Cote, 2011; Cote et al., 2010; Webster-Stratton & Reid, 2004). Special education teachers typically report feeling ill-equipped to address difficulties their students encounter in the domain of social skills and they are conscious of the fact that they lack the background knowledge and professional skills to deliver relevant well-structured, individually tailored training programs. Accordingly, the interventions they usually carry out in relation to social skills acquisition and performance improvement are often quite simplified, poorly designed and of limited effectiveness (Didaskalou, Stavroussi, & Vlachou, 2015; Pavri, 2004). As is stated below, the design of this study certainly does not allow for any generalization of the findings across all special schools and teachers. Nevertheless, it might support further the view that special teachers could be more effective in delivering instruction on interpersonal problem-solving skills to students with intellectual disabilities after having received adequate targeted training, consultancy and guidance by external professionals and researchers (Webster-Stratton & Reid, 2004). Special consideration, which may be critical for the outcomes, to some of the structural and procedural characteristics of instructional programs on interpersonal problem solving for students with intellectual disabilities should be given by all those involved in designing and implementing them. These considerations mainly refer to certain core components to be included in the program, optimal instructional methodologies to be used and delivery procedures to be applied. It is critical for the effectiveness of the intervention program to integrate a preliminary and post instruction generalization and maintenance assessment of students' abilities in identifying and solving interpersonal problems (Cote, 2011; Cote Sparks & Cote, 2012; Crites & Dunn, 2004). The pre-instruction assessment outcomes will dictate the objectives of the following phases of the training program and determine to a large extent the pace of the intervention implementation as well as the length of time required. The present instructional model permits teachers to conduct an ongoing evaluation of students' skills acquisition, practice and retention throughout the intervention process, which in turn amplifies its advantages and optimistic outcomes (Cote, 2011; Glago, Mastropieri, & Scruggs, 2009). It is essential for teachers to systematically monitor and gather data on students' progress and to keep a detailed record of their performances over each stage of the intervention. This data provides direct input on the mastery of skills in each of the implementation phases and may serve as guidance for instructors in making any important reformulation of the instruction content and objectives (Cote, 2011; Glago, 2005). It is expected that the information collected will facilitate the delivery of instructional segments of the program in the subsequent stages of the implementation process, thus further enhancing its effectiveness.

For interventions targeting the development of the social skills of students with disabilities to be successful, it is important that instructional components are well designed, structured and applied according to a pre-planned delivery protocol (Cote, 2011; Cote et al., 2010; Glago, 2005). Direct precise teaching, which follows a series of sequential steps, has been recommended and widely used for instructing students with disabilities in the acquisition and enhancement of performance requiring problem-solving skills (Cote, 2011; DeGeorge, 1989; Palmer, Wehmeyer, Gipson, & Agran, 2004). Direct instruction mainly involves modeling by the teacher, role play and guided practice through work scenarios. It also entails the coaching and application of skills in games and activities that correspond to the interests and real life experiences of the target students. Providing multiple opportunities for rehearsing and practicing the skills, utilizing visual prompting and directly rewarding any successful application of the taught competences in any work example, or other real occasion, are but a few of the strategies employed in the improvement of skills performance and retention (Glago, 2005; Webster-Straton & Reid, 2004).

Conclusions - Implications

The results of this study strongly support the hypothesis that well-organized instruction on interpersonal problem solving skills improved the abilities of the study participant to solve potential issues arising from peer interactions. Nonetheless, the methodological characteristics of this research certainly pose several constraints concerning the generalizability of the findings. Its design does not allow for any claim to be made regarding the expansion of the applicability of its outcomes beyond the single study participant across all students with mild intellectual disabilities (Bock, 2007). Hence, future research may need to work on expanding the outcomes of this study and exploring further the applicability and effectiveness of the training program focusing on interpersonal problem solving skills involving students with intellectual or other types of disabilities. Furthermore, the reliability of the outcomes of this study may be improved upon by future researchers with the inclusion of a post-instructional maintenance assessment; planned and conducted in a reasonable time following the completion of the training program. This would provide an evaluation of the long-term retention of acquired skills and improved performance (Crites & Dunn, 2004; Palmer et al., 2004). Finally, as the participant in this research was a student with mild intellectual disabilities, the non-severe nature and type of his difficulties may have positively affected the process of delivery of the training program and its outcomes. Hence, future research needs to explore whether this particular instructional model might be equally effective for students with more severe educational needs and/or disabilities (Cote et al., 2010).

Despite the constraints cited above, some significant implications, which may be worthy of consideration, can be derived from this research. The positive outcomes of the present instructional program indicate that special teachers can easily modify its objectives and delivery processes to meet the unique needs and abilities of their students and subsequently utilize it to strengthen their students' interpersonal problem-solving skills (Cote, 2011; Cote Sparks & Cote, 2012). To secure better and longer-term maintenance of outcomes, it is critical for teachers to pre-plan the implementation of the instructional program and ensure the fidelity of its delivery procedure. Through events at school and incidents that arise during peer interactions teachers could provide students with opportunities to practice the taught skills with a view to improving their performance (Cote et al., 2010).

Given the recent emphasis on promoting inclusive education within the international policy agenda, researchers and professionals in the field should coordinate their work towards the implementation of similar intervention programs within mainstream classrooms (Cote Sparks & Cote, 2012). The specialized staff and educators designated in schools should join their endeavors towards incorporating the existing empirically-tested instructional programs on interpersonal problem solving, which have already been actualized in pull-out settings, into mainstream classrooms and curriculum (Cote Sparks & Cote, 2012; Cote et al., 2010). For instance, Webster-Stratton and Reid (2004) described the process of adaptation and incorporation of the "Problem-solving Child Training Program", which was initially designed for students with conduct disorders, into the mainstream preschool and primary education curriculum. These researchers contend that mainstream teachers are receptive to brief training on the implementation of such programs and efficient in delivery of these to students when they are provided with a daily script that features lesson plans and social skills objectives. Since mainstream teachers have been identified as key players in the process of realizing inclusive education (Didaskalou et al., 2015; Pavri & Hegwer-DiVita, 2006), emphasis needs to be placed, during their initial and in-service training, on designing and delivering individually tailored instructional programs targeting the enhancement of interpersonal problem-solving skills of students with disabilities. Specifically, there has been documented a need for teachers to receive adequate training in carrying out systematic assessments of their students' strengths and difficulties in the social domain which, in turn, will inform the core components of their interventions (Didaskalou et al., 2015). Consequently, the provision of systematic collaboration between teachers and other professionals within the school setting would be beneficial to the promotion of teachers' skills in identifying and addressing the individual needs of their students with intellectual disabilities. In conclusion, equipping learners with disabilities with sufficient skills

that allow them to participate actively in school life and successfully resolve interpersonal problems arising amongst peers still constitutes a key objective for educational institutions and teachers.

REFERENCES

Agran, M., Blanchard, C., Wehmeyer, M. L., & Hughes, C. (2002). Increasing the problem-solving skills of students with developmental disabilities participating in general education. *Remedial and Special Education, 23*(5), 279-288.

Agran, M., & Hughes, C. (2005). Introduction to special issue: Self-determination re-examined: Are people with severe disabilities any more self-determined? *Research & Practice for Persons with Severe Disabilities, 30*, 105-107.

Algozzine, B., Browder, D., Karvonen, M., Test, D. W., & Wood, W. (2001). Effects of interventions to promote self-determination for individuals with disabilities. *Review of Educational Research, 71*, 219-277.

Anderson, G., & Kazantzis, N. (2008). Social problem-solving skills training for adults with mild intellectual disability: A multiple case study. *Behaviour Change, 25*(2), 97-108.

Andreou, E., Didaskalou, E., & Vlachou, A. (2013). Bully/victim problems among Greek pupils with special educational needs: Associations with loneliness and peer interactions. *Journal of Research in Special Educational Needs, 15*(4), 235-246.

Bock, M. (2007). A social-behavioral learning strategy intervention for a child with Asperger syndrome. *Remedial and Special Education, 28*(5), 258-265.

Browning, R., & Nave, G. (1993). Teaching social problem solving to learners with mild disabilities. *Education and Training in Mental Retardation, 28*(4), 309-317.

Castles, E. E., & Glass, C. R. (1986). Training in social and interpersonal problem-solving skills for mildly and moderately mentally retarded adults. *American Journal of Mental Deficiency, 91*(1), 35–42.

Cote, D. L. (2011). Implementing a problem-solving intervention with students with mild to moderate disabilities. *Intervention in School and Clinic, 46*(5), 259-265.

Cote Sparks, S., & Cote, D. L. (2012). Teaching choice making to elementary students with mild to moderate disabilities. *Intervention in School and Clinic, 47*(5), 290-296.

Cote, D., Pierce, T., Higgins, K., Miller, S., Tandy, R., & Sparks, S. (2010). Increasing skill performances of problem solving in students with intellectual disabilities. *Education and Training in Autism and Developmental Disabilities, 45*(4), 512-524.

Crites, S. A., & Dunn, C. (2004). Teaching social problem solving to individuals with mental retardation. *Education and Training in Developmental Disabilities, 39,* 301-309.

DeGeorge, K. (1989). Friendship and stories: Using children's literature to teach friendship skills to children with learning disabilities. *Intervention in School and Clinic, 33*(3), 157-162.

Didaskalou, E., Stavroussi, P., & Vlachou, A. (2015). Defining, identifying and assessing social and personal skills difficulties of students with special educational needs: The special

education teachers' perspectives. In E. Kourkoutas & A. Hart (Eds.), *Innovative practice and interventions for children and adolescents with psychosocial difficulties and disabilities* (pp. 295-326). London, UK: Cambridge Scholars.

D'Zurilla, T. J., & Goldfried, M. R. (1971). Problem solving and behavior modification. *Journal of Abnormal Psychology 78*(1), 107-126.

D'Zurilla, T. J., & Maydeu-Olivares, A. (1995). Conceptual and methodological issues in social problem-solving assessment. *Behavior Therapy, 26*(3), 409-432.

D'Zurilla, T. J., Nezu, A. M., & Maydeu-Olivares, A. (2004). Social problem solving: Theory and assessment. In E. C. Chang, T. J. D'Zurilla, & L. J. Sanna (Eds.), *Social problem solving: Theory, research and training* (pp. 11-27). Washington, DC: American Psychological Association.

Edeh, O. M. (2006). Cross-cultural investigation of interest-based training and social interpersonal problem solving in students with mental retardation. *Education and Training in Developmental Disabilities, 41*(2), 163-176.

Erozkan, A. (2013). The effect of communication skills and interpersonal problem-solving skills on social self-efficacy. *Theory and Practice, 13*(2), 739-745.

Foxx, R. M., Kyle, M. S., Faw, G. D., & Bittle, R. G. (1989). Problem solving skills training: Social validation and generalization. *Behavioral Interventions, 4*(4), 269-288.

Frederickson, N. L., & Furnham, A. F. (2004). Peer-assessed behavioural characteristics and sociometric rejection: Differences between pupils who have moderate learning difficulties and their mainstream peers. *British Journal of Educational Psychology, 74*(3), 391-410.

Frostad, P., & Pijl, S. J. (2007). Does being friendly help in making friends? The relationship between the social position and social skills of pupils with special needs in mainstream education. *European Journal of Special Needs Education, 22*(1), 15-30.

Gay, L. R. Mills, G. E., & Airasian, P. (2012). *Educational research: Competencies for analysis and applications* (10th ed.). Upper Saddle River, NJ: Pearson Education.

Glago, K. D. (2005). The effect of problem solving self-determination instruction on elementary students with learning disabilities and emotional disabilities. *Dissertation Abstracts International, 66*(2), 549.

Glago, K. D., Mastropieri, M. A., & Scruggs, T. E. (2009). Improving problem solving of elementary students with mild disabilities. *Remedial and Special Education, 30,* 372-380.

Haring, N. G., & Eaton, M. D. (1978). Systematic instructional procedures: An instructional hierarchy. In N. G. Haring, T. C. Lovitt, M. D. Eaton, & C. L. Hansen (Eds.), *The fourth R: Research in the classroom* (pp. 23-40). Columbus, OH: Merrill.

Joseph, L. M., & Konrad, M. (2009). Teaching students with intellectual or developmental disabilities to write: A review of the literature. *Research in Developmental Disabilities, 30*(1), 1-19.

Kemmis, S., & McTaggart, R. (Eds.). (1988). The action research planner (3rd ed.). Geelong, Victoria: Deakin University Press.

Loumidis, K. S., & Hill, A. (1997). Training social problem-solving skills to reduce maladaptive behaviours in intellectual disability groups: The influence of individual difference factors. *Journal of Applied Research in Intellectual Disabilities, 10*, 217-237.

Nezu, A. M. (2004). Problem solving and behavior therapy revisited. *Behavior Therapy, 35*(1), 1-33.

Nezu, C. M., Nezu, A. M., & Arean, P. (1991). Assertiveness and problem-solving training for mildly mentally retarded persons with dual diagnoses. *Research in Developmental Disabilities, 12*(4), 371-386.

Palmer, S. B., Wehmeyer, M. L., Gipson, K., & Agran, M. (2004). Promoting access to the general curriculum by teaching self-determination skills. *Exceptional Children, 70,* 427-439.

Parker, D. C., & Burns, M. K. (2014). Using the instructional level as a criterion to target reading interventions. *Reading & Writing Quarterly, 30*(1), 79-94.

Pavri, S. (2004). General and special education teachers' preparation needs in providing social support: A needs assessment. *Teacher Education and Special Education, 27*(4), 77-87.

Pavri, S., & Hegwer-DiVita, M. (2006). Meeting the social and emotional needs of students with disabilities: The special educators' perspective. *Reading & Writing Quarterly, 22*(2), 139-153.

Pellegrini, D. S., & Urbain, E. S. (1985). An evaluation of interpersonal cognitive problem-solving training with children. *Journal of Child Psychology and Psychiatry, 26*(1), 17-41.

Rubin, K. H., & Krasnor, L. R. (1986). Social-cognitive and social behavioral perspectives on problem solving. In M. Perlmutter (Ed.), *The Minnesota symposium on child psychology: Cognitive perspectives on children's social and behavioral development* (Vol. 18, pp. 1-68). Hillsdale, NJ: Erlbaum.

Sargent, L., Perner, D. E, Fesgen, M., & Cook, T. (2012). *Social skills for students with autism spectrum disorders and other developmental disorders: Secondary school lesson plans 51-100.* Arlington, VA: Council for Exceptional Children.

Shure, M. B. (2001). I can problem solve (ICPS): An interpersonal cognitive problem-solving program for children. *Residential Treatment for Children & Youth, 18*(3), 3-14.

Shure, M. B., & Spivack, G. (1979). Interpersonal cognitive problem solving and primary prevention: Programming for preschool and kindergarten children. *Journal of Clinical Child Psychology, 8*(2), 89-94.

Shure, M. B., & Spivack, G. (1982). The problem-solving approach to adjustment: A competency-building model of primary prevention. *Prevention in Human Services, 1*(1-2), 87-103.

Siperstein, G. (1992). Social competence: An important construct in mental retardation. *American Journal on Mental Retardation, 96*(4), iii–vi.

Stavroussi, P., Dermitzaki, I., & Miliadou, A. (2010). Social problem solving in children with Down syndrome: Preliminary investigation of children's response patterns. *ICERI 2010 Proceedings*, 5487-5494.

Sukhodolsky, D. G., & Butter, E. M. (2007). Social skills training for children with intellectual disabilities. In J. W. Jacobson, J. A. Mulick, & J. Rojahn (Eds.), *Handbook of intellectual and developmental disabilities* (pp. 601-618). New York, NY: Springer.

Vaughn, S. R., Ridley, C. A., & Cox, J. (1983). Evaluating the efficacy of an interpersonal skills training program with children who are mentally retarded. *Education and Training of the Mentally Retarded, 18*(3), 191-196.

Vlachou, A., & Stavroussi, P. (2016). Promoting social inclusion: A structured intervention for

enhancing interpersonal problem solving skills in children with mild intellectual disabilities. *Support for Learning, 31*(1), 27-45.

Webster-Stratton, C., & Reid, J. (2004). Strengthening social and emotional competence in young children. The foundation of early school readiness and success. *Infants and Young Children, 17*(2), 96-113.

Wehmeyer, M. L., & Palmer, S. B. (2003). Adult outcomes for students with cognitive disabilities three years after high school: The impact of self-determination. *Education and Training in Developmental Disabilities, 38*, 131-144.

Wehmeyer, M. L., Shogren, K. A., Zager, D., Smith, T. E. C., & Simpson, R. (2010). Research-based principles and practices for educating students with autism: Self-determination and social interactions. *Education and Training in Autism and Developmental Disabilities, 45*, 475-486.