THE DEVELOPMENT AND VALIDATION OF AN INTERACTIVE HYPERMEDIA PROGRAM FOR TEACHING A SELF-ADVOCACY STRATEGY TO STUDENTS WITH DISABILITIES

Paula E. Lancaster, Jean B. Schumaker, and Donald D. Deshler

Abstract. Educators agree that students with disabilities need to acquire self-advocacy skills. Despite the existence of validated methods to teach these skills, evidence suggests that they are seldom explicitly taught. Time and opportunities to teach these skills in both the general and special education setting are minimal. One possible solution is to use instructional technology.

The purpose of this project was to develop and validate an Interactive Hypermedia Program (IHP) to teach a self-advocacy strategy to secondary-level students with disabilities. The strategy for which the IHP was developed and tested is the Self-Advocacy Strategy (Van Reusen, Bos, Schumaker, & Deshler, 1994). The instruction for the strategy was originally validated by Van Reusen, Deshler, and Schumaker (1989). With input from student, teacher, design, and technical consultants, the IHP was created. Students who had learning disabilities, behavior disorders, and other health impairments learned the strategy via the IHP or through live instruction. A multiple-baseline design was used to show the effects of the instruction. In addition, a no-treatment comparison group was included for comparative purposes. At the conclusion of instruction, each student ran his or her own IEP conference. Results showed that the IHP was as effective in teaching students with learning disabilities to use the strategy as live instruction. Further research is warranted to determine if this medium is effective in teaching students other types of strategies.

PAULA E. LANCASTER, Ph.D., is assistant professor, Grand Valley State University.
JEAN B. SCHUMAKER, Ph.D., is associate director, University of Kansas Center for Research on Learning, and adjunct professor, Department of Special Education, University of Kansas.
DONALD D. DESHLER, Ph.D., is director, University of Kansas Center for Research on Learning, and professor, Department of Special Education, University of Kansas.

Adolescence is a time during which most individuals assume power and control to advocate for themselves. Yet few individuals with disabilities ever adequately learn to use this power and control to become independent and self-sufficient (Michaels, 1994). For example, surveys of adolescents with learning disabilities (LD) have shown that 66% of them have never talked to a teacher about their learning problems and

approximately 70% have relied on their parents or resource teachers to advocate for them (Wilson, 1994). Further, although federal law calls for student participation in the individualized education plan (IEP) conference, research shows that such participation is not occurring (Grigal, Test, Beattie, & Wood, 1997; Williams & O'Leary, 2001). Many parents express dissatisfaction with their own involvement in the IEP process (Garriott, Wandry, & Snyder, 2000), claiming that the interests and needs of their adolescent children with disabilities are often not reflected in the goals and objectives stated on their IEPs (Wilson, 1994). Such parental reports have been substantiated through research showing that a mean of one IEP goal is generated by youths who are not trained in self-advocacy skills (Van Reusen, Deshler, & Schumaker, 1989). Research has also demonstrated that youths rarely make positive comments about themselves or suggest goals they would like included on their IEPs (Van Reusen, 1985). Thus, a lack of involvement in decision-making by adolescents with disabilities is matched by an overall lack of assertiveness (Wilson, 1994).

While most adolescents without disabilities gradually develop self-determination and self-advocacy skills, many adolescents with LD and other high-incidence disabilities (e.g., behavior disorders and mild emotional disturbance) require explicit instruction in these skills if they are to be generalized to situations such as the IEP conference. Such instruction should include an explanation of the potential value of the skills and when and where to use them, opportunities to observe experts modeling both the use of the skills and the metacognitive processes involved in their successful use, opportunities to practice the skills, and immediate feedback on the learner's knowledge and use of the skills (Ellis, Deshler, Lenz, Schumaker, & Clark, 1991).

Although many models exist for teaching self-determination skills to adolescents with LD (e.g., Field & Hoffman, 1996; Phillips, 1990; Serna & Lau-Smith, 1995), a review of the literature (Lancaster, 1999) revealed that few programs for teaching self-determination skills and knowledge, considered crucial for successful transitions and post-school outcomes, have undergone enough empirical research and evaluation to warrant the expenditure of valuable instructional time on their implementation. Although data have been gathered on some programs, the data tend to focus on self-reports of students, parents, and teachers involved in the program, with few experimental controls (e.g., Abery, Rudrud, Arndt, Schaubon, & Eggebeen, 1995; Field, Hoffman, & Posch, 1997; Halpern, Herr, Wolf, Doren, Johnson, & Lawson, 1997; Harris & McKinney, 1993; Ludi & Martin, 1995; Phillips, 1990; Zhang, 2001).

The field tests of two programs, the Self-Advocacy Strategy (Van Reusen, Bos, Schumaker, & Deshler, 1994) and TAKE CHARGE for the Future (Powers, Turner, Westwood, Matuszewski, Wilson, & Phillips, 2001), are exceptions. The field test of the Self-Advocacy Strategy was an experimentally controlled study using behavioral measures in actual conferences as well as simulated situations to test the efficacy of instruction in self-advocacy knowledge and skills including: an awareness of learning strengths and weaknesses and available services and accommodations, and the communication skills that enable students to act on such knowledge. Following instruction in the Self-Advocacy Strategy program, students with disabilities are able to (a) inventory their strengths, weaknesses, learning needs and interests; (b) lead their conference; (c) speak about their strengths, weaknesses, needs, and interests; (d) contribute goals to the IEP documents; and (e) transfer these skills to educational planning meetings with school counselors, job and/ or college meetings, and any other situation in which a student may wish to influence the decision-making process (Van Reusen et al., 1994). Results reported on the effectiveness of this program include a significant difference in the number of relevant contributions provided by experimental students during the IEP conference and in the number of student-generated goals included on the experimental students' IEPs compared to students in the comparison group (Van Reusen et al., 1989).

The field test of TAKE CHARGE for the Future involved an experimentally controlled study using self-report and behavioral measures following completion of the program and during the actual transition conference to test the efficacy of instruction in terms of increased student involvement in transition planning, student and parent transition awareness, and student and family empowerment (Powers et al., 2001). TAKE CHARGE for the Future is described as a four-month curriculum. Students meet bi-weekly with their teacher for 50-minute coaching sessions (Powers et al., 2001) focusing on helping students identify and achieve specific transition goals by applying strategies from the TAKE CHARGE for the Future program. Students also attend monthly community-based workshops along with their parents and adult mentors. Mentors and students are invited to participate in community activities such as visiting the mentor's college, place of employment, or home and sharing recreational activities. Another component of the program includes support for parents such as telephone calls and home visits. The final component is an inservice professional development for staff.

Although educators place a high value on teaching self-determination skills (Durlack, Rose, & Bursuck, 1994; Patton, Cronin, & Jairrels, 1997), finding the time and opportunity to teach packages of these skills such as

those included in the Self-Advocacy Strategy and the TAKE CHARGE program can be challenging. Most students with high-incidence disabilities spend the majority of their time in general education classrooms; however, this time is reserved for content-based instruction (Ellis, 1997). Thus, even if general education teachers recognize the value of teaching self-determination skills, the demands already placed on them are overwhelming (Schumaker & Deshler, 1994), making it unlikely that they will have the time and opportunity to teach these skills. The remainder of these students' class time is often spent in the resource setting, primarily on academic and/or skill/strategy-related concerns. That is, resource teachers often divide time with students between assessing and remediating academic needs, providing instruction in learning strategies, and meeting students' daily academic demands by tutoring them on general education assignments (Carlson, 1985). Further, resource class sizes are frequently too large to provide individualized, intense instruction (Moody, Vaughn, & Hughes, 2000). Beyond this, resource teachers assume other roles within the school such as consultant, collaborator, team member, public-relations representative, and disseminator of information (Jackson, 1992). These roles and responsibilities make finding time for explicitly teaching students self-determination and advocacy skills very difficult.

One way of addressing the issues of time and opportunity to teach self-determination skills involves using educational technology such as interactive hypermedia (IH), a type of computer programming that can include video and audio segments, text, graphics, and animation and that responds to the learner by providing individualized feedback and by controlling the learner's movement based on his or her progress. Recent improvements in digital storage devices such as CD-ROMs offer new possibilities for integrating motion, graphics, still pictures, and digitized sound (Morrison, Ross, & Baldwin, 1992; Wissick, 1996). These improvements may not only enhance student interest and motivation, they may also eliminate overuse of text, which could inhibit the learning of poor readers. Most important, through the use of technology, teacher instructional time might be reduced dramatically as students work independently. Thus, through the use of this instructional medium, teachers could be freed up to give specific feedback individually to many students.

Not only has IH programming been recommended as an option for instructing students with high-incidence disabilities, the research literature also supports the notion that these students can learn skills and gain knowledge through computer-based instructional programs (e.g., Bottge, 2001; Jones, Torgesen, & Sexton, 1987; van Daal & van Der Leij, 1993). Learning appears to be enhanced when certain instructional features are built into the programs, including detailed explanations (Higgins & Boone, 1990); scaffolded practice (Kelly, Gersten, & Carnine, 1990); feedback (Collins, Carnine, & Gersten, 1987; Horton, Boone, & Lovitt, 1990); anchored instruction (Bottge & Hasselbring, 1993; Xin & Reith, 2001); and interactivity (Grossen & Carnine, 1990). Nevertheless, despite the potential advantages and rationales for utilizing IH formats as an integral part of instruction, limited empirical evidence exists on how they can be used to enhance the learning of complex skills by students with disabilities (Woodward & Reith, 1997). Studies in this area have focused on instructing such skills as textbook comprehension (MacArthur & Haynes, 1995); vocabulary acquisition (Xin & Reith, 2001); study guide use (Higgins, Boone, & Lovitt, 1996); basic fraction facts (Kelly et al., 1990); decoding (Jones et al., 1987); and problem solving (Glaser, Reith, & Kinzer, 1999). Although one study demonstrated the efficacy of a video-based game aimed at enhancing social problem solving (Goldsworthy, Barab, & Goldsworthy, 2000), no studies thus far have determined the effectiveness of teaching self-determination skills to students with disabilities through computerized formats.

The specific purposes of this study were to develop an interactive hypermedia version of instruction in the Self-Advocacy Strategy for students with high-incidence disabilities and to validate this IH version by assessing: (a) student knowledge of the component parts of the strategy and rationales for its use; (b) student use of the strategy during IEP conferences; (c) number of student-created IEP goals and objectives; (d) student and teacher satisfaction; and (e) required teacher instructional time. The Self-Advocacy Strategy was chosen because the scope of instruction and content provided for easy conversion to the IH format, and the field test of the TAKE CHARGE for the Future program had not been completed at the time of the current study. The overall goals associated with the study were to provide secondary-level special educators with a validated option for teaching students with high-incidence disabilities to participate actively in planning education and transition programs and to determine whether students with high-incidence disabilities can learn complex self-determination skills and information via the IH format with limited teacher interaction at a level comparable to that achieved by students who receive live instruction.

Specifically, the following six questions were addressed: (a) Do significant differences exist between students who receive instruction in the Self-Advocacy Strategy through the IH version versus students who receive live instruction and versus students who receive no instruction regarding their use of the self-advocacy skills addressed in the strategy? (b) Do significant differences exist between students

who receive instruction in the Self-Advocacy Strategy through the IH version versus students who receive live instruction and versus students who receive no instruction regarding the number of student-created goals and objectives on their IEPs? (c) Do significant differences exist between students who receive instruction in the Self-Advocacy Strategy through the IH version versus students who receive live instruction regarding their knowledge of the Self-Advocacy Strategy? (d) Are the satisfaction levels with the IEP conference expressed by the students who receive instruction through the IH version different from the satisfaction levels of students who receive live instruction and who receive no instruction? (e) Are the satisfaction levels with the IEP conference expressed by the parents, teachers, and other adults of students who receive instruction through the IH version different from the satisfaction levels of parents, teachers, and other adults of students who receive live instruction and who receive no instruction? (f) Does IH instruction of the Self-Advocacy Strategy require less face-to-face teacher-to-student instructional time and the same amount of student time as live instruction?

METHODOLOGY

Participants

Subjects were 22 high school students with high-incidence disabilities whose IEP conferences fell between October, 1998 and April, 1999, and who had previously been placed in the resource program on the recommendation of a multidisciplinary special services team with documented parent or guardian approval. Each of the 22 subjects was receiving resource services for at least one hour per day, but for no more than three hours per day. The students volunteered to participate after they heard a presentation about the study; both students and their parents subsequently signed consent forms. Students were allowed to choose whether they would participate in the instruction because they were adolescents who were participating in an instructional program in their school in which they were given choices for what they learned and when they learned it. This principle was fundamental to their instructional programming. In addition, the researchers wanted to have a test of the interactive hypermedia program in which students were actually engaged in using the technology or actually engaged in the live instruction versus resisting it. Thus, they wanted to include students who volunteered for the instruction in the two experimental groups. These two groups were randomly selected from the pool of students who volunteered for the instruction. Thus, random selection was accomplished for the major research question in this study: the comparison of live versus interactive hypermedia instruction.

Participants chose whether they wished to participate in the comparison group (NI or No Instruction group) or one of the experimental groups. Students who chose to be in one of the experimental groups were randomly assigned to either the Live Instruction (LI) group ($N = 8$) or the Interactive Hypermedia (IH) instruction group ($N = 8$). The names of all students who agreed to participate in one of the experimental groups were placed in a box. For purposes of assigning students to groups, the LI Group was designated as Group One, and the IH Group was designated as Group Two. A research assistant drew the first name and placed that student's name in Group One. The second name drawn was placed in Group Two. The third name was placed in Group One, and so on, until all the names had been drawn. Six students chose to participate in the NI group. All students were paid $6 per hour for their participation.

Table 1 provides descriptive characteristics of the groups, Table 2 provides academic characteristics, and Table 3 shows the composition of the groups by disability, and reading achievement scores. As shown in Table, 1, the groups consisted of a mix of students with learning disabilities (LD), behavior disorders (BD), and other health impairments (OHI), with substantially more males than females participating. Table 2 shows that despite a wide range of achievement and IQ scores, the groups were similar across categories. Table 3 shows that mean reading scores for students with LD were substantially lower than for students with BD and for most students with OHI. Kruskall-Wallis analysis of variance yielded no statistical differences between the groups related to demographics, achievement test scores, and intelligence test scores.

The District and Instructional Settings

The school district is located in a medium-sized midwestern community with a population of approximately 70,000 citizens. Two high schools in the district serve approximately 1,200 students each in grades 10 through 12. Individual instruction took place in the school library. Live instruction took place at a table situated at the back of the library, while IH instruction took place at a computer station next to the table. Students and the researcher were not secluded from other students using the library. Instruction was provided during class periods when students were normally assigned to attend the learning resource center.

The Self-Advocacy Strategy

The Self-Advocacy Strategy is designed to help students prepare for and participate in any type of conference situation. Prior to learning the steps of the strategy, students are taught five behaviors, called the SHARE Behaviors, that enable them to communicate effectively

Table 1
Descriptive Characteristics

Group	Disability			Gender		Race/Ethnicity				SES	Age
	LD	BD	OHI	M	F	AA	NA	API	W	Free/Red Lunch	
IH	4	2	2	7	1	1	0	0	7	2	17.1
LI	5	2	1	7	1	1	1	0	6	2	17
NI	5	1	1	6	0	0	0	1	5	1	16.7

Note. AA-African American, NA-Native American, API-Asian/Pacific Islander, W-White.

Table 2
Academic Characteristics

Group		IQ Scores			Achievement Test Scores			Mean Grade Level	Mean GPA
		Verb	Perf.	Full	Math	Rdg.	Written		
IH	Mean	44.3	55.6	51.7	33.1	51.8	41.2	11.3	2.6
(N = 8)	Range	2-99	27-98	5-99	3-81	1-99	2-99		
LI	Mean	46.9	59.8	53.6	45.9	43.6	28.6	11.1	2.1
(N = 8)	Range	10-97	22-94	14-93	1-96	12-95	3-77		
NI	Mean	33.2	57.7	43.7	31.7	38.3	38.8	10.5	2.0
(N = 6)	Range	10-70	12-98	10-90	12-81	10-85	4-80		

Note. IH = Interactive Hypermedia experimental group, LI = Live Instruction experimental group, and NI = No Instruction comparison group. Weschler IQ and Woodcock-Johnson Achievement scores are reported in percentiles.

during conferences (see the left half of Table 4). Once students have mastered the "SHARE" Behaviors, they learn the five steps of the Self-Advocacy Strategy (shown in the right half of Table 4). Specifically, during the *Inventory Step,* students complete a personal inventory, a written document within which they list their strengths, areas to improve, goals in various areas, and their learning and testing preferences to prepare for their upcoming IEP conference. The second step, *Provide Your Inventory Information,* focuses on identifying the appropriate time to share information during the conference, speaking clearly and completely, and referring to the inventory as needed. The next step, *Listen and Respond,* addresses being an active listener and responding to questions and statements made by other participants in a positive manner. The *Ask Questions* step focuses on preparing questions in advance of the conference and on asking spontaneous questions when other participants make statements that students do not understand. Finally, *Name Your Goals* addresses stating goals written on the inventory and negotiating so that student goals as well as goals suggested by teachers or parents appear on the IEP.

The first letters of the five steps of the strategy spell the phrase "I PLAN." Thus, the steps are often referred to as the I PLAN Steps. As specified in the original Self-Advocacy Strategy instructor's manual (Van Reusen et al., 1994), the steps of the strategy are to be taught using a specific sequence of instructional stages. First, the SHARE Behaviors and the I PLAN Steps are described. Then behaviors and skills are modeled, and multiple practice

activities are completed. For example, students verbally practice with the teacher by reciting the steps of the strategy as well as the meanings of important terms. They also practice using the steps by participating in two types of role-play activities: controlled practice activities and advanced practice activities. During controlled practice, they simply practice by answering isolated questions in response to simulated comments. During advanced practice, they participate in a simulated conference.

Table 3

Reading Achievement Scores by Condition

Condition by Group	Reading Scores
IH Group	*M* = 51.8
LD (*N* = 4)	*M* = 22.3
BD (*N* = 2)	*M* = 97
OHI (N = 2)	97
LI Group	*M* = 43.6
LD (*N* = 5)	*M* = 33.8
BD (*N* = 2)	*M* = 58
OHI (*N* = 1)	21
NI Group	*M* = 38.3
LD (*N* = 5)	*M* = 32
BD (*N* = 1)	43

Note. IH = Interactive Hypermedia experimental group, LI = Live Instruction experimental group, and NI = No Instruction comparison group. Woodcock-Johnson Reading Achievement scores are reported in percentiles.

Measures

Strategy Use Measure

Student use of the strategy was measured in three ways. First, an *oral test* was given comprised of 10 probe questions. These were the same questions that were used in the original validation study of the Self-Advocacy program (Van Reusen, 1985). They were included here to ensure that all students had equivalent numbers of opportunities to respond during controlled and advanced practice sessions and the actual IEP conference. A relevant response was any statement, response, or question the student shared that pertained to the IEP (i.e., statements of strengths, weaknesses, goals; statements of concern about school; remarks about testing results) in response to one of the probe questions. Each relevant response was awarded one point, and points were totaled to obtain the Relevant Response Score for each session for each student.

Second, the researcher (during role-play activities and the actual IEP conference) and teacher (during the IEP conference only) used the *SHARE Checklist* to record whether students were using the SHARE Behaviors. This checklist included five items, each of which corresponded to a SHARE Behavior. A student earned one point for each SHARE Behavior used. The SHARE Behavior Score was the percentage of points earned on the checklist.

Third, the *PLAN Checklist* was used by the researcher during role-play situations and by the teacher and the researcher during the IEP conference to record whether students used the PLAN Steps. In order to earn one point for using the "P" step, *Provide Your Inventory Information,* students had to name at least three strengths, three areas to improve, and three learning or testing preferences. In order to earn one point for the "L" step, *Listen and Respond,* students had to provide

Table 4

SHARE Behaviors and Steps of the Self-Advocacy Strategy

SHARE Behaviors	Steps of the Self-Advocacy Strategy
• Sit up straight	• Inventory your strengths, needs, goals, & choices
• Have a pleasant tone of voice	• Provide your inventory
• Activate your thinking	• Listen & respond
• Relax	• Ask questions
• Engage in eye communication	• Name your goals

more relevant than irrelevant responses throughout the conference. To earn one point for *Ask Questions,* students had to ask at least one relevant question during the conference, and to earn one point for *Name Your Goals,* students had to name at least three present or future goals. A student's PLAN Steps Score was the percentage of points earned on the *PLAN Checklist.*

Goals

Relevant student-created IEP goals and objectives were independently recorded verbatim by two scorers while listening to audiotapes of the conferences. Student-created IEP goals and objectives were considered relevant if they pertained to the student's strengths, weaknesses, statements of concern about school, present and future goals and interests, extracurricular goals and interests, and learning preferences and interests. These goals were checked against goals that appeared in the IEP document. The student's IEP Goal Score was the percentage of total goals appearing in the IEP document that were contributed by the student during the conference.

Satisfaction

Student and Adult Satisfaction Questionnaires were used to measure the social validity of the instruction. All items on the Student Satisfaction Questionnaires were arranged in a 5-point Likert-type scale. The following items were included: (a) I understand why this IEP conference was held; (b) I knew what was going to happen at the conference; (c) I think it was important that I attended the conference; (d) I felt prepared to participate in the conference; (e) I felt free to ask questions during the conference; (f) I was given opportunities to answer; (g) My parents and teachers listened to what I said during the conference; (h) I was able to tell my parents and teachers what learning skills I need to improve this year; (i) I feel that I helped develop some of the goals that were written for me at this conference; (j) I'm satisfied with the goals developed for me at this conference; (k) I think the goals will help me with school; (l) I think the goals will help me to have success after I finish school; (m) I feel I know what my goals are this year; and (n) I feel I understand what my learning problems are.

The Adult Satisfaction Questionnaire consisted of two parts. In the first part, participants rated their satisfaction on a 5-point Likert-type scale with each of nine items: (a) The students' presence at this conference was beneficial; (b) The student appeared to understand the purpose of the conference; (c) The student was able to respond to IEP-related questions; (d) The student asked IEP-relevant questions; (e) The student was asked appropriate questions during the IEP conference; (f) The student was encouraged to participate in the conference; (g) The student appeared prepared to participate in the conference; (h) The student's contributions impacted on the IEP goals and instructional activities developed for the student at this IEP meeting; and (i) The student's contributions led to the development of at least some of the student's IEP goals and objectives.

In the second part of the questionnaire, adults were asked to place a checkmark on the line next to the type of information the student shared during the conference. Types of information included test-taking preferences, strengths, weaknesses, past effective learning aids, present goals and interests, future goals and interests, preferences for receiving instruction, goal-agreement statements, and skills on which the student wants to work.

Instructional Time

Instructional time was measured in the form of a journal record kept by the researcher. Specifically, each day the researcher recorded the start and stop times, including the hours and minutes, for the Self-Advocacy Strategy instruction using a stopwatch.

Strategy Knowledge

The Knowledge Measure consisted of a 15-item test that required students to write or dictate the definition of self-advocacy, the situations in which they should use the strategy, and the names of the SHARE Behaviors and the PLAN Steps. All items were open-ended. One point was awarded for each correct answer. A student's Knowledge Score was the percentage of points earned on the test.

Reliability

Interscorer reliability on the *SHARE* and *PLAN Checklists* was determined by having two scorers independently score 10 sessions and then comparing their records item by item. The percentage of agreement for these measures was 100%. Interscorer reliability on relevant responses to the probe questions was determined by having two scorers independently score 30% of the tape-recorded responses to probe questions across the experimental conditions. The points awarded by the two observers were compared item by item for each of the 10 probe questions. The percentage of agreement for this measure was 97%. A similar approach was used to determine reliability for responses during the IEP meeting. For these meetings, the scorers agreed on 88% of the responses. Reliability for teacher and student instructional time was determined for 10 of the instructional sessions during which two independent scorers kept time with stopwatches. Times were recorded to the second and compared for accuracy. An agreement was tallied when the two scorers' records matched within five seconds. The percentage of agreement was 100% for both teacher and student time. Interscorer reliability for the Knowledge Test was determined by having two scorers independently score five tests before and

after instruction. The points awarded were compared item by item. The percentage of agreement was 97%.

Instructional Materials

Instructional Materials for the IH Group

The Self-Advocacy CD-ROM (SACD) was developed in partnership with teacher and student consultants at two Kansas high schools, and with Dr. Van Reusen, one of the creators of the Self-Advocacy Strategy. All teacher consultants were special education teachers who taught in resource room settings and specialized in strategy instruction, all student consultants were secondary-level students enrolled in special education classes. The researcher observed teacher and student consultants during live instruction in the Self-Advocacy Strategy and interviewed both groups to determine the content and features they viewed as crucial to successful instruction of the strategy. Based on their feedback, the researcher divided the content into instructional sessions and wrote drafts of the scripts to be used by the student-consultants who would appear in the CD-ROM. The researcher and student consultants edited the scripts. Student consultants were then audio- and videotaped describing and modeling the strategy. These audio- and videotapes were used to provide instruction on the CD-ROM.

The resulting IH program (SACD) presents the content of the Self-Advocacy Strategy instruction in a nonlinear format; it allows students to navigate individually through the instruction, repeating lesson segments and reviewing content as needed, requiring little teacher time. It is comprised of a series of six lessons. Clicking on any of the lessons takes the students to the opening screen of the lesson where the student instructors welcome them, and instruction begins. At any time, students may exit the lesson by clicking on the main menu button located along the bottom or the top of the screen. Although recommendations are made in the first lesson about the order in which students should work through the lessons, they are free to choose the order. That is, the SACD opens to the main menu wherein students may choose to go to any of the six lessons including "Introduction," "SHARE," "Inventory," "PLAN," "Model Conferences," and "Review." Each lesson contains text with audio explanations and brief video clips of the student instructors describing and modeling the strategy. Three of the computerized lessons end with a quiz over the content with feedback provided on student performance, and all lessons guide students to complete certain activities. At the end of the lessons, students are asked to review the material and demonstrate the SHARE Behaviors and PLAN Steps to their teacher.

Figure 1 provides a graphic depiction of a screen in the Introduction session. Once the screen opens, the video clip begins, and the student instructor describes what a "self-advocate" is. She says, "An advocate is a person who is a voice for someone or something like a lawyer who defends someone in a court of law. To be a self-advocate means that you are your own voice and that you are able to express your own ideas and interests to people in a successful way." Subsequent screens in this session include video and audio clips of other students talking about how the strategy has helped them and how they continue to use it in various ways.

Figure 2 depicts a screen within the SHARE session. Once this screen opens, the video clip begins, and the student instructor provides an elaborate explanation and model of the first SHARE Behavior, Sit Up Straight. In subsequent screens, the student instructor provides descriptions and models of each SHARE behavior. Then students have an opportunity to watch video clips of other students using the behaviors. The session ends with a quiz over the SHARE Behaviors on which students must correctly answer 70% or more of the questions before they can move on to the next session. If they earn a lower score, they are instructed to repeat the session.

Figure 3 depicts a screen in the PLAN session. This screen opens with an audio clip of the student instructor in which he says, "The 'L' stands for Listen and respond. If you want people to listen to you, you have to listen to them. Some things to remember when you are listening are: don't interrupt, be an active listener, use the SHARE steps, use your inventory, use positive statements, and negotiate agreement. Watch the video clips to see the results when someone does not listen and respond and what can happen when he does." Students then watch two video clips that show a student in a review session with his teacher. In the first clip, the student does not use the skills, and the teacher consequently decides to discontinue the review session. In the second example, the student does use good listening and responding skills, and the review session is very productive. Subsequent screens provide explanations about using the inventory, making positive statements, negotiating agreements, and the remainder of the PLAN steps. Similar to the SHARE session, students also watch video clips of other students running their own conferences and using the PLAN steps in other situations. This session also ends with a quiz.

During the Inventory session, students have an opportunity to identify their strengths as well as areas to improve in various academic and transition-related areas. For example, they can identify strengths and areas to improve related to reading, mathematics, and writing as well as career and employment, citizenship, and recreation and leisure. They do this by first selecting an area. Each area contains a list of approximately 20 items. *Use a dictionary to find the meaning of words* and *Find and*

Figure 1. Screen shot from the introduction session of the self-advocacy CD.

Figure 2. Screen shot from the SHARE session of the self-advocacy CD.

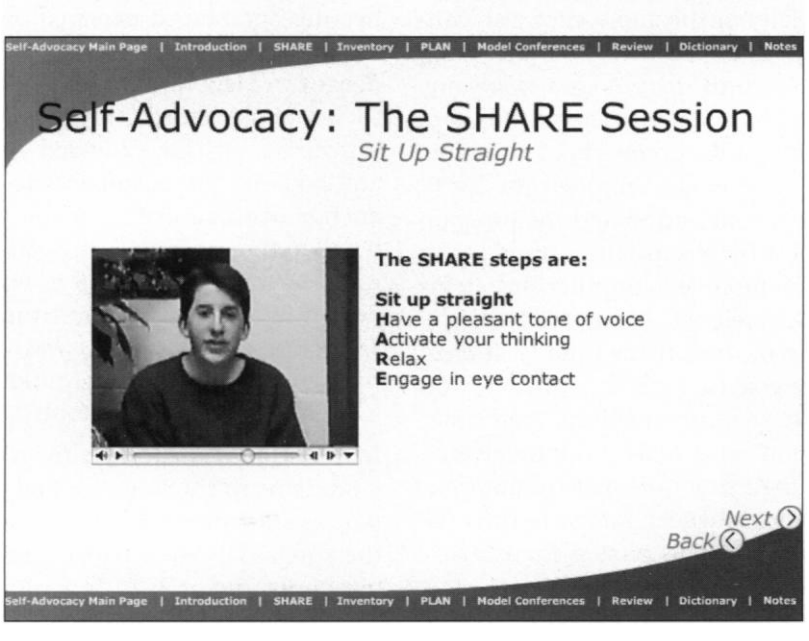
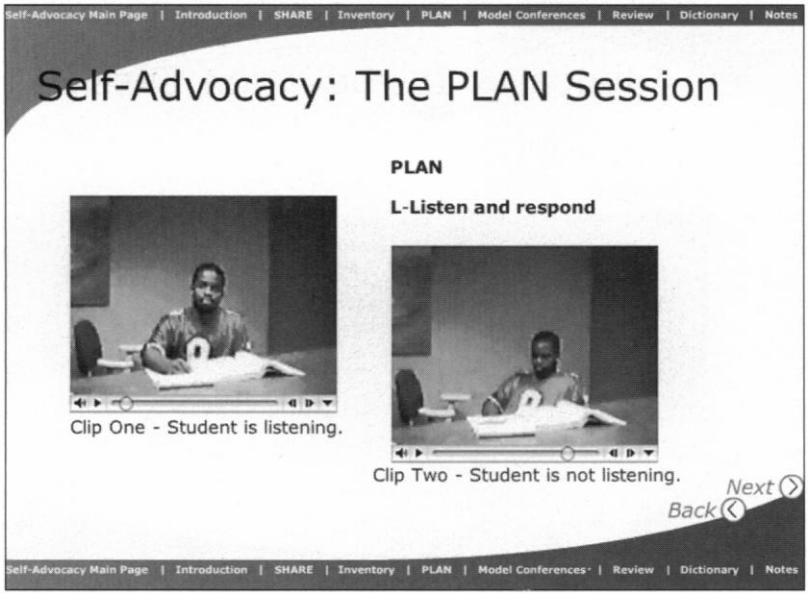


Figure 3. Screen shot from the PLAN session of the self-advocacy CD.



remember main ideas and details in a paragraph are examples of items in the reading list. Each item has a corresponding audio clip option so the item can be read to students if necessary. Many of the audio clips also contain additional descriptions of the item. For each item, students can click on the words *strength, area to improve,* or *neither.* (They are told to click on *neither* if the item does not relate to anything they do in school, at home, or at work.) Once they have worked through the list of items, they click on the *submit* button and the program now summarizes their list by placing their strengths in one column and areas to improve in another. The items identified as *neither* are deleted. Next, students are instructed to choose two or three items from their *areas to improve* list and type a goal for each one into a box on the screen. When they have finished writing their goals, they click a *submit* button once again, and are given a summary screen listing their strengths, areas to improve, and goals, which they print and keep for use in their IEP conference. Students complete this process for as many areas as they or their teacher decide are pertinent.

Several features were built into the SACD to help students with disabilities learn and maintain their attention and motivation. For example, a dictionary of key terms is a feature that students may access from any screen by clicking on the dictionary button. The dictionary allows them the option of reading definitions or hearing audiotaped explanations of the term in question. A note-taking screen is also available where students can view notes for each of the lessons and print them out as needed. Throughout the program, student instructors provide extended explanations of the skills and content, guide students to practice the skills, and anchor instruction in real-life situations. Students listened to the program with headphones and were free to repeat instruction as often as was needed. Literature on designing educational software (Marchionini, 1988; Szul & Woodland, 1998) was considered in choosing the screen layout, background design, colors, special features, and navigation tools.

Instructional Materials for the LI Group

Students in the LI group had access to the same content as students in the IH instruction group; however, their materials were paper-based handouts distributed by the instructor as information was delivered live. In addition, they received blank inventory worksheets, a personal inventory sheet, and the same notes and dictionary of terms as the IH group.

Procedures

Baseline Procedures

Prior to instruction, all students were grouped based on the date of their IEP conference and their experimental group assignment. Students whose IEP conferences fell approximately within the months of October and November 1998 were grouped together. The same procedure was followed for students whose IEP conferences fell approximately within the months of December 1998 and January 1999; February and early March 1999; and late March and April 1999. The IEP conferences of six students (two students receiving live instruction, two students receiving instruction via the IH program, and two students receiving no instruction) fell within each time frame. All students completed three baseline probes spread over approximately two weeks. During each baseline probe, the 10 probe questions were administered to each student. When the third baseline probe was completed, the student in each experimental pair whose baseline was stable completed a Knowledge Test and began instruction. The other student in each experimental pair completed at least one additional baseline probe prior to completing the Knowledge Test and instruction. For comparison pairs, one student (the one whose baseline was stable after three probes) received three baseline probes; the other received at least four probes. No Knowledge Test was given to these comparison students, and no instruction was provided.

Instructional Procedures.

Live instruction. Instruction for the LI group followed the format and procedures laid out in the Self-Advocacy Strategy instructor's manual (Van Reusen et al., 1994). The researcher led all the one-on-one instructional sessions and was actively involved in asking and answering questions, modeling the steps and behaviors, role-playing with the students, and providing feedback to students. Instruction took place in five or six 30- to 45-minute sessions, depending on student progress. During the role-playing activities, students were given two additional oral tests. In each test, they were asked to answer 10 IEP-related questions. After each student answered all 10 questions, the researcher provided feedback on the student's use of the SHARE Behaviors and the completeness of the answers.

IH instruction. Students in the IH group also completed instruction in five or six 30- to 45-minute sessions. The role of the instructor was to introduce students to the SACD, ensure they were using it correctly, check for understanding following completion of each lesson, answer any questions, and role-play with the students once they had completed the SACD instruction. Students completed the same role-play activities followed with feedback by the researcher as students in the LI group.

Post-Instruction Procedures

General conference procedures. Special education teachers scheduled and conducted the IEP conferences. Students were given anywhere from one-week to one-month notice of the date of their upcoming conference, depending on the arrangements that could be made. The student, a resource teacher, and the researcher were present for all conferences. In all but three conferences, at least one parent was also present. The transition coordinator for the district was also present in 10 of the conferences. Other participants present at one or more conferences included siblings, a probation officer, a school psychologist, a building-level administrator, general education teachers, and a representative of Vocational Rehabilitation from the state of Kansas.

The IEP conferences were held in either a conference room in the main office or in a special education classroom. The first few minutes were similar across all conferences. Once all the attendees were present, the special education teacher initiated introductions and began by explaining the purpose of the conference. Then the teacher asked each student if he or she had anything to share. Students in the experimental groups shared the contents of their inventories and suggested goals they wished to work toward. Students in the comparison group either shared information they had written down prior to the conference or declined to comment. As the conference continued, teachers asked each question from the oral test that the student had not addressed, and other attendees added pertinent information. Thus, students in all three groups were given the oral test one time during the IEP conference. Following the IEP conference, each student, teacher, and other adult attending were asked to complete a satisfaction questionnaire. Students placed their completed questionnaire in a folder marked "Student." Teachers placed their questionnaires in a folder labeled "Teachers," and other adults placed theirs in a folder labeled "Other Adults."

Preparation for experimental subjects. Prior to each IEP conference, the researcher met with each student in the LI and IH groups to review the IEP conference procedures and to remind them (a) to share information on their inventories, (b) to ask any questions they wanted during the conference, and (c) to share their thoughts at appropriate times. The researcher also asked each student if he or she had questions about the upcoming conference and answered any questions raised. She gave each student the personal inventory completed by the student at the beginning of the conference.

Preparation for the NI subjects. Prior to each IEP conference, the researcher met with each NI student individually for approximately 20 minutes, described

the procedures and sequence of events to take place during the conference, and asked each student to write down any information he or she wished to share with the other conference participants. The researcher pointed out that the IEP conference was designed for the student and that the student therefore should feel free to share any thoughts, concerns, or questions he or she had. The researcher also explained that the student should suggest any goals, interests, or preferences he or she had related to school, career, and any other aspect of life. The researcher suggested that the student write these concerns, goals, interests, and preferences on paper and share them at the IEP conference and gave the student time to do so. Finally, the researcher collected any notes the student wrote and returned them to the student at the beginning of the conference.

Instructions to participating resource teachers. Participating resource teachers were given a list of questions that they were to ask during the conferences in order to elicit responses from the students, and were encouraged to allow the students opportunities to speak after each question. (The questions were the probe questions students were administered during baseline.) Teachers were not aware of the experimental group in which students participated. Teachers completed a *SHARE Checklist* and a *PLAN Checklist* on which they checked off the SHARE Behaviors and PLAN Steps they saw students use during the conference.

Research Designs

Three experimental designs were employed simultaneously. The primary design was a multiple-probe across-students design (Horner & Baer, 1978). This design was replicated three times for the two experimental groups to determine the effects of the instruction on students' use of the strategy as measured through their relevant responses to probe questions during baseline, controlled and advanced practice, and the IEP conference. It was also used with the NI group to show the effects of student presence in the actual IEP conference on student responses to the probe questions. A posttest-only comparison-group design (Campbell & Stanley, 1963) was employed to compare the use of the SHARE Behaviors and the PLAN Steps by experimental and comparison students during the IEP conference, the satisfaction ratings of experimental and comparison students, and the satisfaction ratings of parents, teachers, and other adults attending all the conferences. Finally, a pretest-posttest comparison-group design (Campbell & Stanley, 1963) was used to compare the knowledge scores of students in the experimental groups to each other.

RESULTS

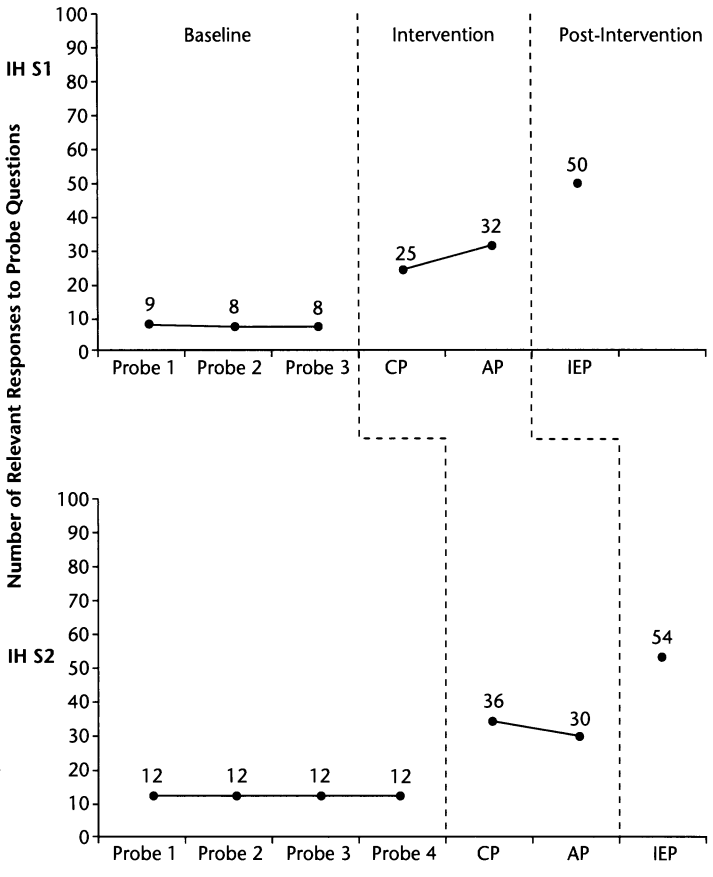
Student Use of the Strategy

Relevant Responses to Probe Questions

Figures 4 through 14 display the quantity of relevant contributions provided by each of the 22 participants. Figures 4-7 are for IH students, Figures 8-11 for LI students, and Figures 12-14 for NI students. Each figure contains two graphs, each graph representing the performance of two students on the oral tests and during the IEP conference. The first vertical dotted line in Figures 4-11 represents the time when instruction was initiated. No such line appears in Figures 12-14 as the comparison group students received no instruction. Figures 4 through 11 demonstrate that the number of relevant responses increased substantially after the onset of instruction for each experimental student, with the highest number of responses occurring during the IEP conference (the final data point on each graph). For example, IH Student 1 (Figure 1, top graph) provided nine relevant responses to probe questions during the first baseline probe, eight during the second probe and eight during the third probe. During the Controlled and Advanced Practice Stages of instruction, IH Student 1 provided 25 and 32 relevant responses, respectively, and during the IEP conference, he provided 50 relevant responses to the same set of questions. Similar results were seen with all of the experimental students, in that they provided at least twice and sometimes three times as many relevant responses to questions during practice sessions and at least three to four times as many relevant responses during the IEP conferences as during baseline. For comparison purposes, Figures 12-14 show that five of the six NI students responded more times during the IEP conference than during baseline probes; however, the rate of increase was substantially less than that of experimental students. For example, NI Student 2 (Figure 12, bottom half) provided 8, 7, 7, and 7, relevant responses on each of three baseline probes and 16 relevant responses during his IEP conference.

A Kruskal-Wallis analysis of variance (KWANOVA) was used to determine whether significant differences existed between the average number of relevant responses made by the three groups during baseline. No significant difference was found between the groups on the mean number of baseline responses [$X^2(2, N = 22) = 12.537, p = .80$]. During the IEP conference, students in the IH group made from 47 to 78 ($M = 62$) relevant responses, students in the LI group made from 41 to 79 ($M = 61.4$) relevant responses, and students in the NI group made from 14 to 33 ($M = 21$) relevant responses. A KWANOVA was employed to determine whether significant differences existed between the two

Figure 4. Number of relevant responses for IH subjects 1 and 2.



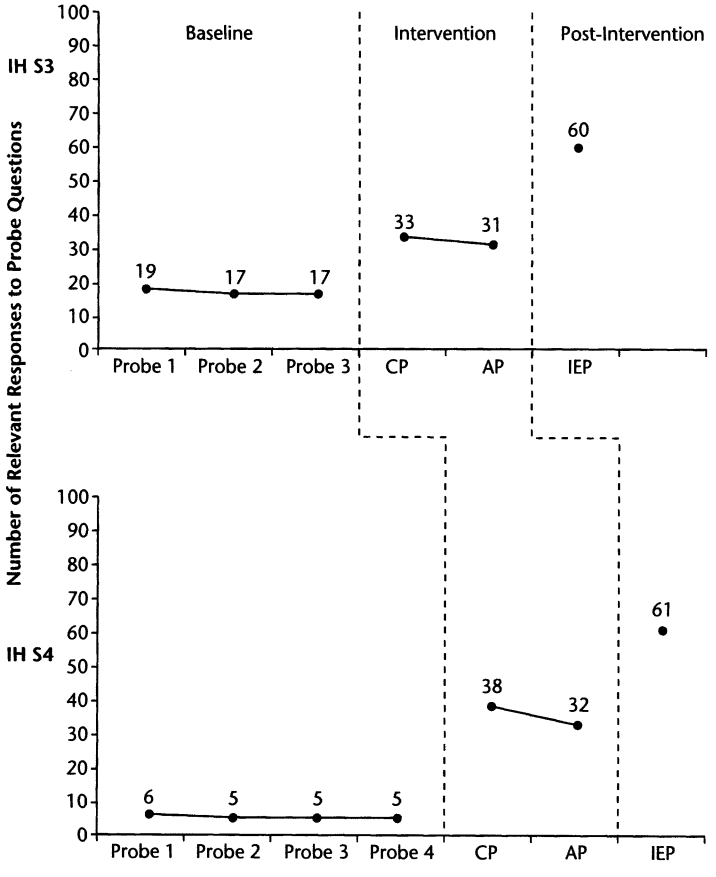
Note. IH = Interactive Hypermedia Group, CP = Controlled Practice, AP = Advanced Practice, IEP = IEP Conference Probes.

experimental groups on controlled-practice scores, advanced-practice scores, and the IEP scores on probes. No significant differences were found between the two experimental groups on the number of relevant responses made during the controlled-practice activities [$X^2(1, N = 16) = .0111, p = .92$], the advanced-practice activities [$X^2(1, N = 16) = .8960, p , = .34$], and during their IEP conferences [$X^2(1, N = 16) = .0028, p = .96$].

KWANOVA results indicated that there was a significant difference between the mean number of responses made during the IEP conference between the three groups [$X^2(2, N = 22) = 12.537, p < .002$]. Post-hoc analyses with the Wilcoxon-Mann-Whitney Test revealed a significant difference between the mean IEP scores of the LI students and the comparison students at the .05 level [$P(W_x < 21) = .0003$] and between the IH group and the comparison students at the .05 level ($W_x < 21) = .0003$].

Further, analyses of covariance (ANCOVA) were employed comparing the mean IEP scores of the LI students to the mean IEP scores of comparison students and the mean IEP scores of the IH students and the mean IEP scores of the comparison students. The score on the final baseline probes was used as the covariate. Results of the ANCOVAs indicated a significant difference between the IEP scores of the LI students and the comparison students [$F(2, 13) = 16.7, p < .001$] and between the IEP scores of the IH students and the comparison students [$F(2, 13) = 35.97, p, .001$].

Figure 5. Number of relevant responses for IH subjects 3 and 4.



Note. IH = Interactive Hypermedia Group, CP = Controlled Practice, AP = Advanced Practice, IEP = IEP Conference Probes.

Student Use of the SHARE Behaviors

Students in the IH group earned an average of 4.94 points out of 5 possible points on the *SHARE Checklist* (99%), while students in the LI group obtained an average of 4.88 points (97%). Students in the comparison group earned an average of 4.33 points (86%). A Kruskal-Wallis analysis of variance (KWANOVA) revealed no significant difference at the .05 level between the three groups on the *SHARE Checklist* [$X^2(2, N = 22) = 1.734, p = .42$].

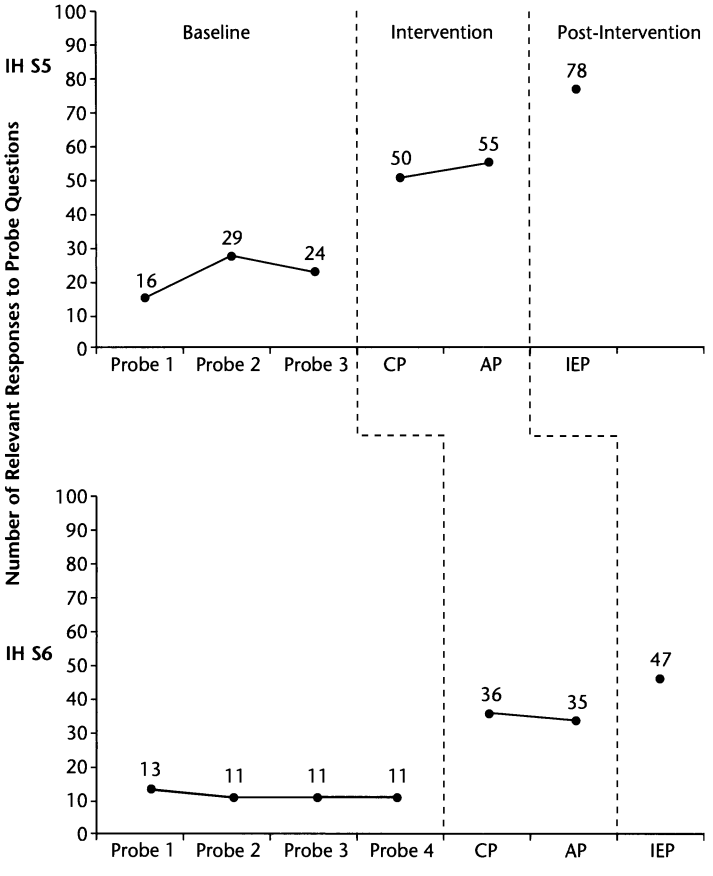
Student Use of the PLAN Steps

All students in the IH and LI groups received four out of four possible points on the *PLAN Checklist* (100%) during their IEP conferences. By comparison, students in the comparison group received an average of 1.7 points (43%). A KWANOVA revealed that there was a significant difference between the mean scores on the *PLAN Checklist* between the three groups [$X^2(2, N = 22) = 25.33, p < .0001$]. Post-hoc analyses using the Wilcoxon-Mann-Whitney Test revealed a significant difference at the .05 level between the mean PLAN score for the LI group and the comparison group [$P(W_x < 21) = .0003$] and also between the IH group and the comparison group [$P(W_x < 21) = .0003$].

Goal Contributions

Students in the IH group contributed between 60-100% of the goals and objectives ($M = 66\%$) on their IEPs; the total number of goals and objectives ranged

Figure 6. Number of relevant responses for IH subjects 5 and 6.



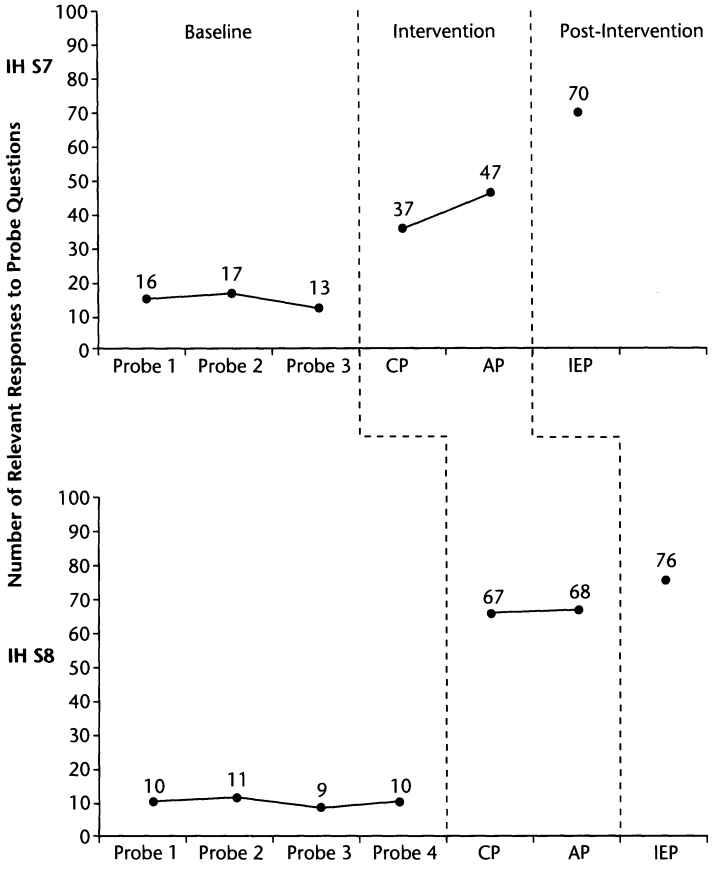
Note. IH = Interactive Hypermedia Group, CP = Controlled Practice, AP = Advanced Practice, IEP = IEP Conference Probes.

from 4 to 12 (M = 7.25). The LI group contributed between 67-100% (M = 79%) of the goals and objectives on their IEPs; the total number of goals and objectives ranged from 3 to 9 (M = 6.7). Finally, students in the comparison group contributed between 0-40% of the goals and objectives on their IEPs (M = 20%); the total number of goals and objectives ranged from 0 to 3 (M = 1.2). A KWANOVA revealed a significant difference between the three groups [$X_2(2, N = 22) = 12.7316$, $p < .002$]. Post-hoc results derived through the use of the Wilcoxon-Mann-Whitney Test revealed a significant difference at the .05 level between the mean percentage of goals contributed by the IH students and the comparison students [$P(W_x < 21) = .0003$] and between the LI students and the comparison students [$P(W_x < 21) = .0003$]. No significant difference was found between the two experimental groups.

Satisfaction

Students. Students in the IH group assigned an average rating between 4.6 and 5 (M = 4.8) for each item of the satisfaction questionnaire while students in the LI group assigned an average rating between 4.6 and 4.9 (M = 4.7). Students in the comparison group assigned an average rating between 3.8 and 4.8 (M = 4.3). Thus, all students were "somewhat" to "very satisfied" with the results of the IEP conference. Although comparison students' ratings were lower than ratings of students in the LI and IH groups on 12 of 14 items, no significant

Figure 7. Number of relevant responses for IH subjects 7 and 8.

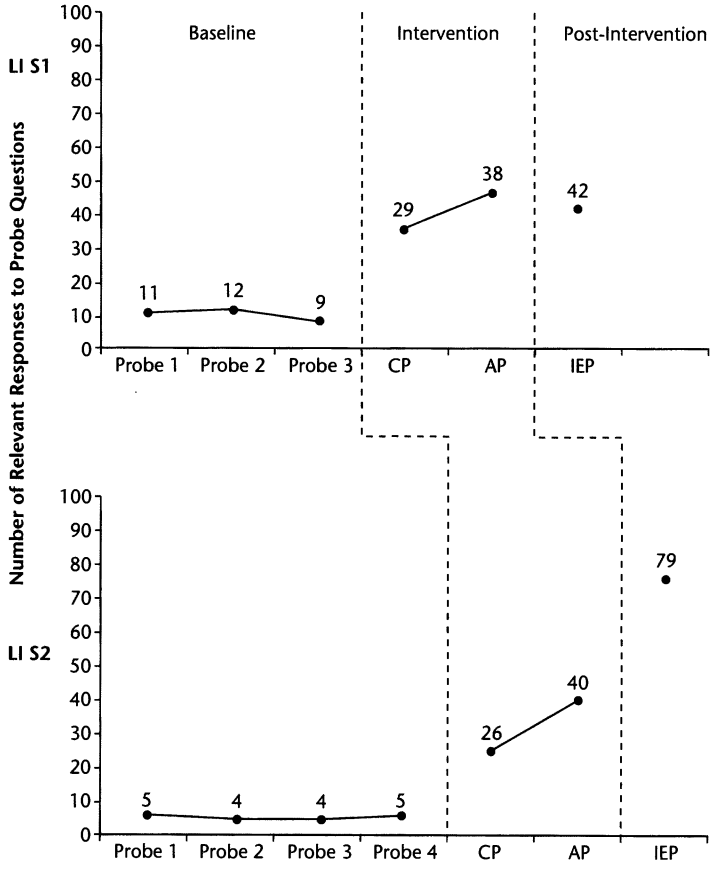


Note. IH = Interactive Hypermedia Group, CP = Controlled Practice, AP = Advanced Practice, IEP = IEP Conference Probes.

differences were found between any of the groups on any of the items.

Adults. On the first part of the questionnaire, ratings ranged from 3.0 to 5.0 regarding their satisfaction with the IEP conference. One-way ANOVA results indicated a significant difference between the adult groups for Item 2 (Student understood the purpose of the conference) [$F(5, 47) = 12.22$, $p < .0001$]; Item 3 (Student was able to respond to relevant questions) [$F(5, 47) = 3.216$, $p < .015$]; Item 4 (Student asked relevant questions) [$F(5, 47) = 5.109$, $p < .001$]; Item 7 (Student appeared prepared for the conference) [$F(5, 47) = 11.264$, $p < .0001$]; Item 8 (Student had an impact on the IEP development) [$F(5, 47) = 8.777$, $p < .0001$]; and Item 9 (Student contributed to the goals and instructional activities included on the IEP) [$F(5, 47) = 8.079$, $p < .0001$]. Post-hoc analyses using the Bonferroni test revealed significant differences at the .05 level on Items 2, 4, and 7 between the ratings of the teachers of comparison students and the ratings of teachers of LI and IH students, and also between the ratings of other adults attending the conferences of comparison students and the ratings of adults attending the conferences of LI and IH experimental students. For Items 3, 8, and 9, the Bonferroni test revealed significant differences at the .05 level between the ratings of the teachers attending the conferences of comparison students and the ratings of teachers and other adults attending

Figure 8. Number of relevant responses for LI subjects 1 and 2.

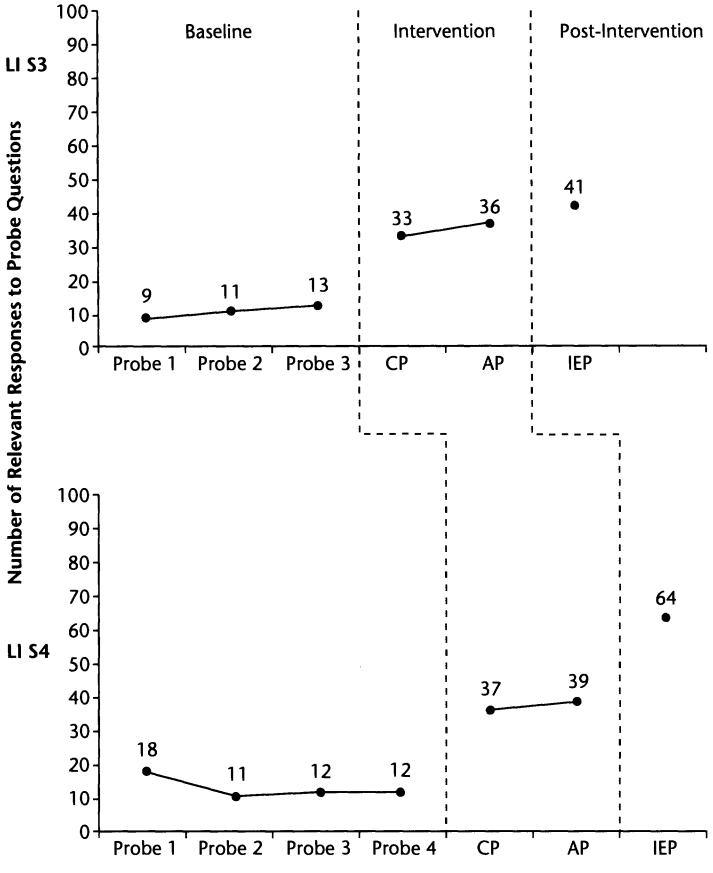


Note. LI = Live Instruction Group, CP = Controlled Practice, AP = Advanced Practice, IEP = IEP Conference Probes.

the conferences of students in the LI and IH groups, indicating that adults attending the conferences of comparison students were less satisfied than adults attending the conferences of experimental students.

With regard to the percentage of students sharing information during the IEP conference for each category of information, adults and teachers were asked to place a check mark next to the category of information for which the student shared information. Percentages were calculated by dividing the total number of responses of adults and teachers present at IEP conferences for all students in the group who indicated that students did respond to a particular category of information by the total number of adults and teachers present at IEP conferences for all students in the group. For example, for the category "stated testing preferences," adults and teachers present for all IEP conferences of students in the IH group indicated that 100% of students in this group shared information about their testing preferences. Adults and teachers attending conferences of students in the LI group indicated that 90% and 85% of students shared information regarding their testing preferences, respectively, and adults and teachers attending conferences of students in the NI group indicated that 60% and 50% of students in this group shared information about their testing preferences, respectively. A one-way ANOVA showed no significant difference at the .05 level between the perceived

Figure 9. Number of relevant responses for LI subjects 3 and 4.



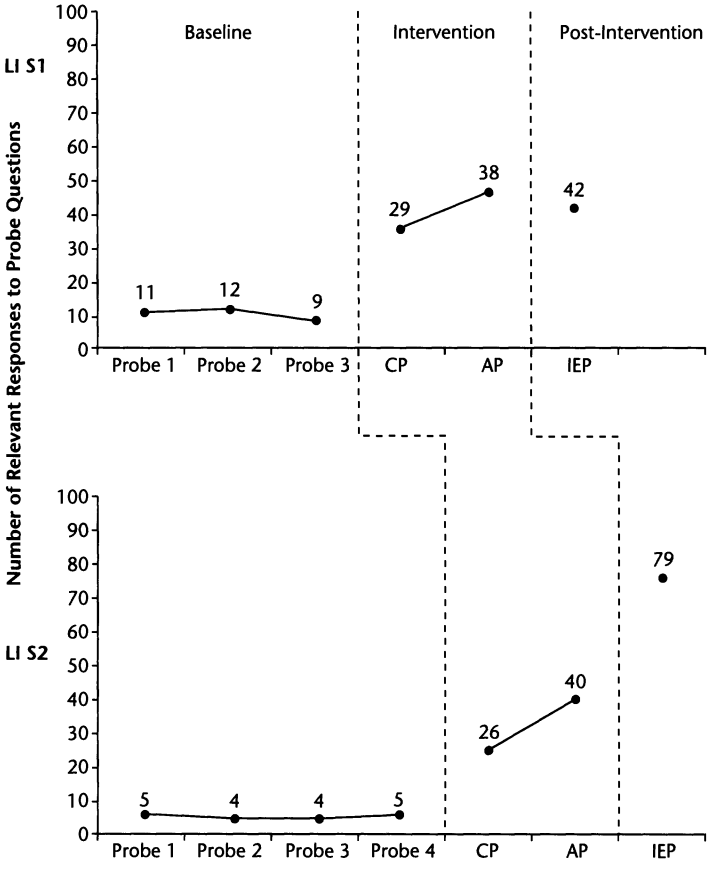
Note. LI = Live Instruction Group, CP = Controlled Practice, AP = Advanced Practice, IEP = IEP Conference Probes.

contributions made by students in the three groups for the category of future goals [F(5, 48) = .6312, p = .68]. However, significant differences were found between the groups for all other categories, including specifying test-taking preferences [F (5, 48) = 2.726, $p < .032$]; naming strengths [F(5, 48) = 4.756, $p < .002$]; naming weaknesses [F(5, 48) = 3.073, $p < .019$]; identifying past effective learning aids [F(5, 48) = 8.36, p .001]; naming present goals [F(5. 48) = 12.626, $p < .001$]; naming group learning preferences [F (5, 48) = 3.076. $p < .018$]; agreeing with goals [F(5, 48) = 2.726, $p < .032$]; and naming skills to improve (F(5, 48) = 4.111, $p < .004$]. Post-hoc analysis indicated that in each case the difference was between teachers and other adults attending the conferences of students in the IH and LI group and teachers and other adults attending the conferences of students in the NI group.

Instructional Time

Teacher time involved in instruction ranged from 54 minutes to 104 minutes (M = 68 min.) for students in the IH group. Six of the eight students required less than 66 minutes of teacher time (M = 59). For students in the LI group, teacher time ranged from 143 to 229 minutes (M = 183 min.). KWANOVA results revealed a significant difference between the two experimental groups in terms of the amount of teacher time required to teach the strategy [$X^2(1, N = 16) = 11.3108$, $p < .0008$].

Figure 10. Number of relevant responses for LI subjects 5 and 6.



Note. LI = Live Instruction Group, CP = Controlled Practice, AP = Advanced Practice, IEP = IEP Conference Probes.

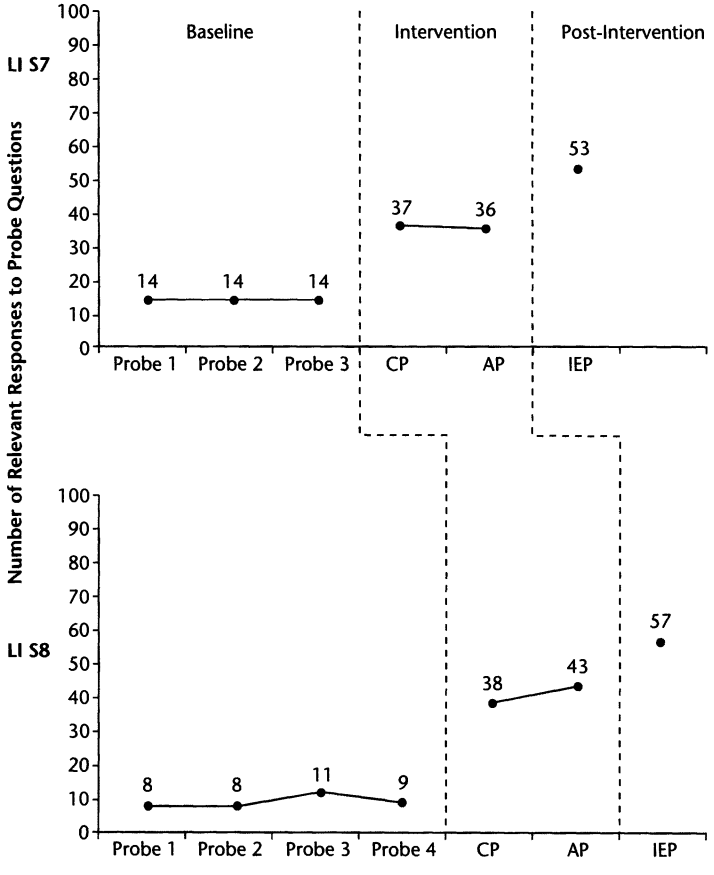
Student Time

The amount of student time required to complete instruction for both experimental groups was calculated and compared. Student time for the IH group, which included time spent working independently on the SACD and role-playing with the teacher, ranged from 140 to 271 minutes (M = 197 min.). Student time for the LI group ranged from 143 to 229 minutes (M = 183 min.). KWANOVA results revealed no significant difference between the amount of time the two student groups spent in instruction [$X^2(1, N = 16) = .3341, p = .56$].

Student Knowledge of the Strategy

Mean percentage scores and standard deviations were calculated for the IH and LI groups on the knowledge pretest and posttest. Students in the IH group correctly answered an average of 19% of the items on the pretest with a standard deviation of 2.70 and an average of 97% of items on the posttest with a standard deviation of .744. Students in the LI group correctly answered an average of 16% of items on the pretest with a standard deviation of 2.39 and an average of 94% of items on the posttest with a standard deviation of .834. To compare the differences between these pretest and posttest scores within each group, T-tests were performed, indicating that: (a) the posttest scores of students in the IH group were significantly higher than their pretest scores [$t(7) = 12.25, p < .00$]; and (b) the posttest scores

Figure 11. Number of relevant responses for LI subjects 7 and 8.



Note. LI = Live Instruction Group, CP = Controlled Practice, AP = Advanced Practice, IEP = IEP Conference Probes.

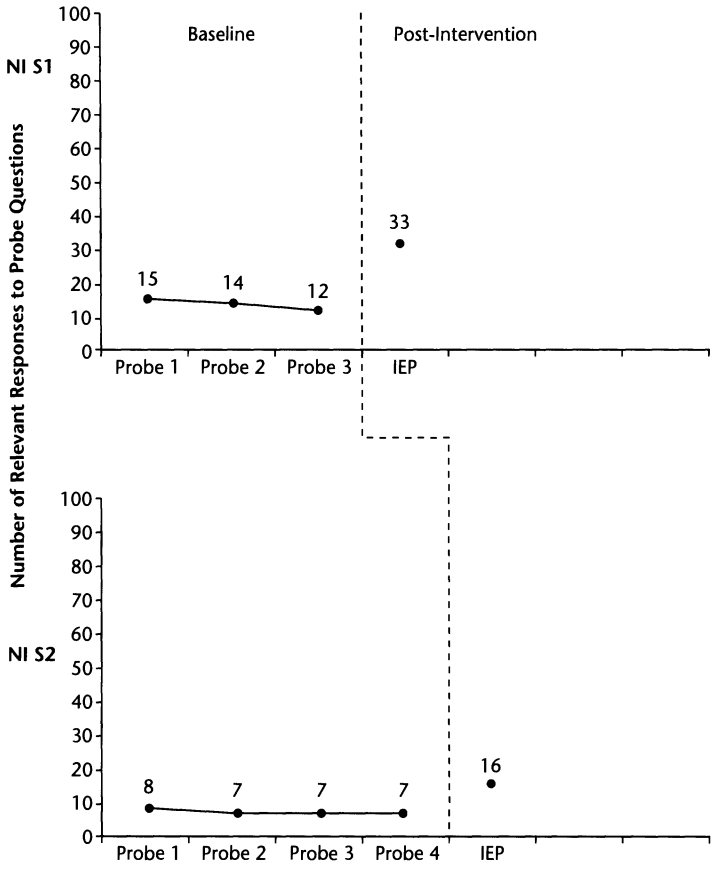
of the LI group were significantly higher than their pretest scores [$t(7) = 12.50$, $p < .00$].

To determine whether the mode of instruction had differential effects on the students' Knowledge Test scores, *T*-tests were performed, indicating no significant difference between the pretest scores [$t(7) = .39$, $p = .70$] and between the posttest scores [$t(7) = 1.26$, $p = .27$] of students in the LI and IH groups.

Discussion

This study demonstrated that an interactive hypermedia program combined with a relatively small amount of teacher interaction (lasting approximately one hour) per student is as effective in teaching a complex self-advocacy strategy to students with disabilities as live instruction involving approximately three hours of teacher time per student. As demonstrated through the multiple-probe design, substantial increases in student responses to probe questions occurred after students participated in the IH or LI instruction. One of the six NI students did show a substantial increase in responses during his IEP conference. One reason might be that his dismissal from special education services was discussed during the conference, and the student was repeatedly asked for his input regarding this change. Overall, students were better able to share information considered important to the IEP such as strengths, weaknesses, learning and testing preferences, and present and future goals than students who did not

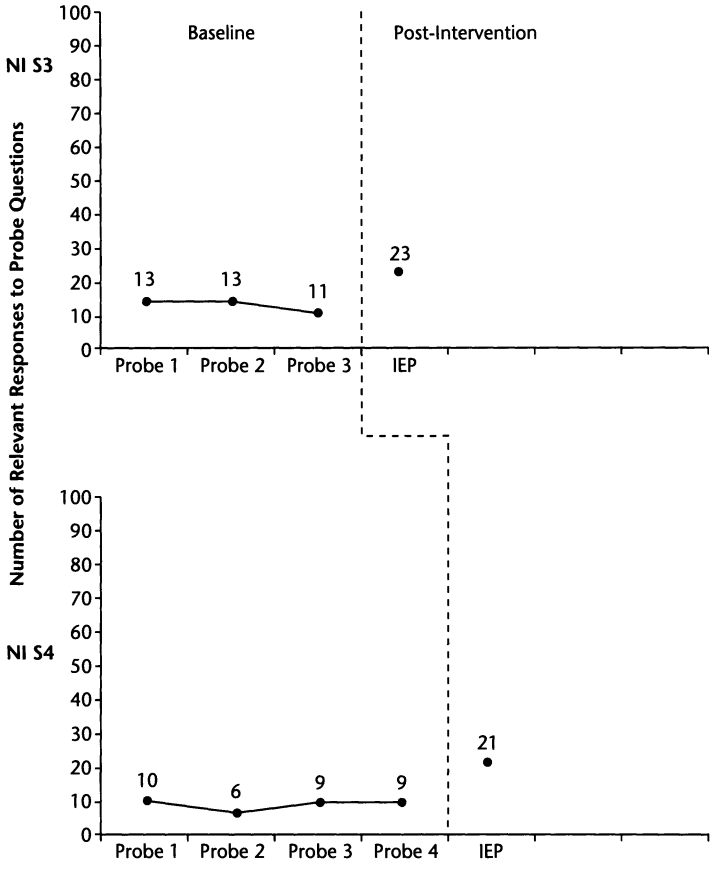
Figure 12. Number of relevant responses for NI subjects 1 and 2.



Note. NI = No Instruction Group, IEP = IEP Conference Probes.

receive instruction. Although most of the students in the comparison group evidenced some gains from baseline to IEP conference with regard to responding to probe questions, their gains were not comparable to those made by the IH students. Students in the experimental groups demonstrated greater knowledge about the concept of self-advocacy following instruction compared to their pretest knowledge level. Students in the experimental groups also contributed significantly more goals to their IEPs than students in the comparison group. The multiple-probe results in this study for the LI and comparison groups are similar to results reported by Van Reusen et al. (1989) when validating the original instructional program in that there is a similar rate of increase. However, in the current study, the mean number of responses made during the IEP conference for the LI, IH, and NI groups were 61, 62, and 21, respectively. In the Van Reusen study, students in the LI group made an average of 98 responses during their IEP conferences, whereas students in the comparison group made an average of 42 responses. Van Reusen was the instructor for the students and led the IEP conference. Thus, students were familiar with him and he was familiar with the IEP procedures. In the current study, the researcher provided instruction; however, prior to the start of the study the researcher was not known to the students, and the special education teachers ran the conferences. The current study appears

Figure 13. Number of relevant responses for NI subjects 3 and 4.



Note. NI = No Instruction Group, IEP = IEP Conference Probes.

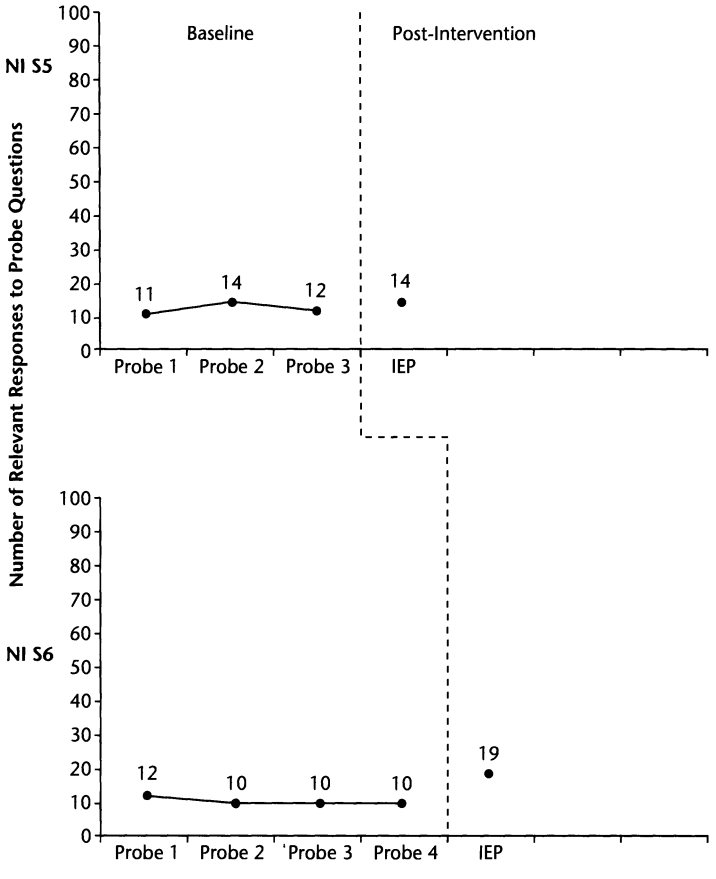
to replicate the results of the Van Reusen et al. study, and also demonstrates that the same skills can be taught through the use of interactive hypermedia.

The use of the SACD saved considerable teacher time compared to live instruction of the strategy (approximately two hours per student). However, it did not totally eliminate the need for the live instruction. That is, although it provided detailed explanations and extensive models, it did not afford the student an opportunity to role-play practice communicating with others. Given today's technology, this kind of practice can only be done live with another person. Thus, some teacher time was required in order for students to master the skills included in this strategy. Finally, the use of the SACD did not require significantly more student time than live instruction. Informal observations of the experimental students revealed that both groups were on-task and attentive during the instruction.

Students in all three groups were equally satisfied with their IEP conferences. This finding matches the findings by Van Reusen et al. (1989), who noted no differences between student groups on satisfaction with the IEP conference.

On some items on the Adult Satisfaction Questionnaires, such as the importance of the student's presence, the questions asked of the student, and the degree to which the student was asked to participate, teachers and other adults from both experimental

Figure 14. Number of relevant responses for NI subjects 5 and 6.



Note. NI = No Instruction Group, IEP = IEP Conference Probes.

groups and the comparison group were equally satisfied. On items pertaining to whether the student understood the purpose of the conference, responded to questions, asked questions, and was prepared for the conference, teachers and other adults who attended the conferences of students in the experimental groups were significantly more satisfied than teachers and adults who attended conferences of students in the comparison group.

Teachers and other adults attending the conferences of both experimental groups and the comparison group equally noted that students shared future goals during the conference. However, they reported differences related to naming test preferences, strengths, perceived weaknesses, present goals, learning preferences, and effective learning activities, with teachers and adults who attended conferences of experimental students checking more of these items than teachers and adults who attended conferences for comparison students.

Thus, this research has replicated the research on self-advocacy instruction by (a) demonstrating that students with high-incidence disabilities can learn and subsequently use self-determination skills; and (b) showing that teachers, other adults, and students will be satisfied with the outcomes of instruction in self-determination skills. The study has extended the research in the area of computerized instruction by providing evidence that students can learn complex social

skills and use them effectively after receiving instruction through the use of an IH format combined with some live role-playing activities. The study has also shown that considerable amounts of teacher time can be saved by using an IH program. Although the effects of the specific features embedded in the IH program (i.e., detailed explanations, modeling, practice, feedback, and interactions) were not measured, as a package, they appeared to be as effective as the live use of these features by the instructor.

Limitations of the Study

Despite these positive findings, the study is limited in the following ways. First, although all instruction did occur in a public school setting, the researcher met with students in the library, not in a classroom. Had instruction taken place in a special education classroom and been led by a special education teacher, the researcher might have been able to draw some conclusions about the feasibility of a teacher including this instruction as part of his or her instructional routine, and students may have been more involved in their conferences. Wehmeyer (1996) pointed out that "Teacher recognition of the importance of skills related to self-determination may be the critical first step in the promotion of self-determination" (p. 129). Thus, had the teachers been involved in the instruction, they might have had a different perspective on how the conferences could have been run and might have provided even more opportunities for student involvement. As it was, most teachers led the conference in a very traditional manner, simply asking the 10 probe questions at some point during each conference as requested by the researcher.

A second limitation involves the selection and number of subjects. Students volunteered to participate out of interest and were paid for their participation. These factors may have affected their motivation to succeed and the generalizability of the data with respect to typical classroom situations in which students might not be given the choice to participate in instruction and are not paid for their participation. The number and diversity of students participating was limited by availability and attrition. Although the initial subject pool contained six females, three of them dropped out of the study (two moved and one was placed in detention), and were replaced by male students because males were more inclined to volunteer to participate.

A third limitation was the shortage of controls for teacher effects during the IEP conferences other than the standard list of questions that all the teachers asked and the fact that none of the teachers knew which students had received live or IH instruction. Some of the teachers occasionally suggested goals or identified strengths before the students had a chance to share this information. Time constraints placed on the teachers and a lack of understanding of the strategy led to some conferences being cut short and some students having limited opportunities to speak. Fortunately, a review of the conferences has indicated that students in all three groups encountered these types of factors during their conferences.

A fourth limitation relates to two of the measures: the *SHARE Checklist* and the *PLAN Checklist.* Because of the small number of items on these checklists, the measures were gross, and differences were not detected among the groups for the SHARE Behaviors. More detailed observations might have revealed differences among the groups.

Implications for Practice

The results of this research indicate that students with disabilities can learn information and skills related to a complex strategy through the use of an IH program plus some teacher instruction. The immediate implication for practice is that the IH program developed here can be used by teachers who are otherwise unable to find sufficient instructional time to meet the requirements of IDEA that students with disabilities be actively involved in setting education and transition goals in their IEP meetings. The long-term implication for practice, given further development and research, is that eventually, teachers who serve students with disabilities may have a variety of IH programs through which they can provide effective instruction in complex strategies.

Future Research

Additional research is needed in several areas. Specifically, research should be conducted to determine the feasibility of teachers using the SACD (and other interactive hypermedia programs focusing on other strategies) in a resource setting when several students are being taught at the same time. A study on the effects of this program with younger students would also be beneficial since several experts (e.g., Ropetto & Correa, 1996; Syzmanski, 1994) have suggested that instruction in self-determination skills should begin as early as possible.

Additional research is also needed on some of the specific instructional features and principles embedded in the SACD. For example, although peer modeling was used extensively throughout the SACD, no studies to date have focused on the impact of providing videotaped models via the computer versus no models, and none has studied the impact of peer models versus adult models. Research also needs to identify those features of instructional software that have the greatest impact on student learning, whether or not students are using the features, and if not, how the features can be better utilized. An informal survey was given to students following completion of the SACD asking them to identify features that they found most and least helpful, identify which features they used most often,

and make suggestions for how the program could be improved. Students overwhelmingly identified the video and audio clips of students describing and modeling the strategy as most helpful, with the dictionary as least helpful. In fact, no students used the dictionary. Four of the eight IH students used the notes and found them helpful. Although most students indicated that the amount of time required to complete the program was about right, two suggested the program could be shortened. Programming features that measure time spent on particular screens or studies that vary the pace and duration of instruction would provide valuable information in this regard.

Further, studies that focus on generalization of self-determination skills are needed. No maintenance data were collected in the original validation study on the Self-Advocacy Strategy (Van Reusen, 1985), nor were they collected during the current study or other studies in the literature focusing on self-determination skills. For this particular strategy, additional research could focus on the impact of using the positive verbal and nonverbal social skills in the SHARE Behaviors and PLAN Steps, the benefits of self-awareness developed through completion of the inventory, and the degree to which these skills influence teachers and other adults who assist students in reaching the goals on their IEP. Thus, research needs to be conducted on the long-term impact of instruction in various self-determination skills on the lives of youths with high-incidence disabilities. Also, in order to determine whether students' use of these skills generalizes to other situations (e.g., meetings with a doctor, a general education teacher, a coach, or co-workers), future studies need to include measures collected in a variety of locales.

In conclusion, finding sufficient instructional time to provide specially designed instruction to secondary-level students with disabilities is a challenge, especially since these students often need individual attention as well as extensive instruction in complex skills and strategies. Interactive hypermedia appears to be useful in providing such instruction. This program can be useful to teachers in that students can be taught individually, results equivalent to those produced with live instruction can be achieved, instruction can be tailored to the special learning needs of students with disabilities, the medium can be used to teach complex sets of behaviors, and teachers can be freed up to work intensively with students who need additional instruction and feedback. Each student who completes the program comes away with a personalized inventory of his or her strengths, areas to improve, goals, interests and preferences. With this information readily available and the skills to share it, students can feel a sense of purpose about and ownership over their education. Future research in this area seems warranted to develop additional instructional interactive hypermedia programs and to illuminate how to best apply them in today's classrooms to promote generalized and long-term use of new skills and strategies.

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NOTES

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Please address correspondence to: Paula Lancaster, School of Education, Grand Valley State University, 301 W. Fulton, Suite 920, Grand Rapids, MI 49504, or email lancastp@gvsu.edu.