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The Effects of Peer Delivered Self-Monitoring Strategies on the Participation of Students With Severe Disabilities in General Education Classrooms

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This study investigated the effects of self-monitoring instruction delivered by peer tutors on the occurrence of academic survival skills displayed by five middle school students with severe disabilities. We employed a multiple baseline across subjects design. Instruction was provided in general education content classes. The students were taught to indicate on a self-recording sheet if they performed each of 11 skills. Data revealed an increase in the percentages of occurrence of survival skills across all students. Also, their general education teachers indicated that they observed a positive change for four of the five students. All students indicated that they believed that they were part of the class and reported an increase in their classroom participation. The implications of these findings are discussed.

DESCRIPTORS: self-monitoring strategies, survival skills, classroom participation

A fundamental shift is occurring in special education (Agran, 1997). Rather than continue to rely on a teacher directed approach in which teachers are fully responsible for delivering instruction and monitoring and evaluating student learning outcomes, a shift to a more student directed approach is becoming evident. Educators "have begun to realize that if students are to be given a more active role in their education and to assume more responsibility for their learning, efforts need to be made to more fully involve students in their own education" (Agran, 1997, p.xi). Student directed learning involves teaching students to use one or more instructional strategies that allow them to plan, perform, or monitor a learning task.

In particular, the value of self-monitoring has been recognized (Agran, 1997; Smith & Nelson, 1997; Wehmeyer, Agran, & Hughes, 1998). Self-monitoring teaches students to observe when a target behavior has occurred and to record its occurrence. Having students monitor their behavior may serve as a strong determinant of behavior change because it may remind them of the consequences that occur after the behavior is performed (Agran, 1997). Further desired change will occur even if the students' recordings are inaccurate (Agran & Martin, 1987). The strategy may serve as a contingency and promote the recurrence of the desired behavior.

To fully include students with severe disabilities in general education classrooms, critical decisions must be made concerning the skills that students will need to be successful. Apart from specific academic competencies, a repertoire of classroom survival skills is needed (Snyder & Bambara, 1997). General education teachers require that students arrive promptly to class, bring appropriate materials, greet teachers and other students

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appropriately, and contribute to class discussion. Jorgensen (1998) suggested that skills relating to social interaction, organization and retrieval of information, working with others, and knowing when to ask questions are strongly associated with classroom success. To successfully accommodate students with disabilities in general education classrooms, it is important to understand and prepare them to meet the demands of these environments (Polloway, Patton, & Serna 2000). Consistent performance of these skills will greatly enhance student learning and participation in general education classroom activities. Interestingly, Snyder and Bambara (1997) indicated that application of student directed learning strategies to promote school survival skills has received little attention. Given the importance of these skills and the instructional efficacy of teaching students to monitor their own behavior, further research is clearly warranted.

Self-monitoring has been used to modify a range of skills and has been taught to and successfully used by students with moderate to severe disabilities. For example, Hughes and Boyle (1991) taught three students with moderate mental disabilities to self-monitor on task behavior and rates of prevocational task production. The students were taught to record whether they were on task upon hearing a tone from an audiotape. Improvements in on task behavior and productivity rates were reported for all participants. Martella, Leonard, Marchand-Martella, and Agran (1993) investigated the effects of self-monitoring on the negative statements of a student with moderate mental disabilities. The student was taught to record and chart the number of positive and negative statements made in a specified time period. An added benefit for the student was that the negative statements decreased and the positive statements increased. Last, Copeland, Hughes, Wehmeyer, Agran, and Fowler (2000) taught four students with mild to moderate mental disabilities to use goal setting, self-monitoring, and self-evaluation strategies to improve their study skills. The study was conducted in a general education classroom. The students were taught to monitor the percentage of study skills they performed and to evaluate their previous day's worksheets based on goals they had set.

Self-monitoring has been used across a variety of applications. However, most of the research has been conducted in self-contained settings with students with mild to moderate disabilities and a restricted set of target behaviors, mostly on task or vocational skills (Agran, 1997). Given the current interest in fully involving students with moderate to severe disabilities in general education, there are few studies conducted in classroom settings and that involved the range of skills students need to be successful in inclusive programs. Self-monitoring, among other student-directed learning strategies, provides supports that help to promote the students' independent performance. As Copeland et al., (2000) suggested, "if students with mental retardation can perform self-management behaviors that reduce their need for assistance in meeting classroom expectations, it may have positive effects on both their classroom performance and on the attitudes of their general education teachers toward their inclusion". Further research on the effects of self-monitoring in promoting successful classroom performance is warranted.

Peer tutors represent an important support system for students with severe disabilities. Kennedy and Itkohen (1994) found that when three high school students with severe disabilities interacted with peer tutors in a general education class over a year, social benefits for the students were significant. Also, contacts with students without disabilities, in and out of a general classroom setting, increased dramatically. Peer tutoring programs provide a number of academic and social benefits to tutor and tutee (McDonnell, Mathot-Buckner, & Ferguson, 1996). Peer tutors have been employed to teach a variety of academic, self-help, communication, and social skills (McDonnell, 1998). They represent a potentially powerful resource to general educators to meet the unique needs of students with severe disabilities. As valued peers, they may be highly motivating to students with disabilities and provide intense one-to-one or small group instruction as needed. In a study on the relative levels of engagement across general and special education classrooms, students with severe disabilities had a high level of engagement with a peer tutor compared with a general education teacher (Helmstetter, Curry, Brennan, & Samson-Saul, 1998). Peer tutors can ensure that students will be actively engaged in learning. However, despite several studies demonstrating the benefits of peer tutoring for students of all abilities, there are few published studies using peers as primary instructors of student directed strategies to students with severe disabilities. Only one study was located in which peers (who also had mental disabilities) delivered instruction on how to use a student directed strategy to other students with mental disabilities. In this study, three students with severe mental disabilities were taught to prepare sack lunches in a university cafeteria by two peer instructors with mild mental disabilities (Agran, Fodor-Davis, Moore, & Martella, 1992). Using peers to deliver self-monitoring strategy instruction to students with disabilities is an area that warrants further research, based on findings that peers may promote and motivate student learning (McDonnell et al., 1996).

The purpose of the present study was to examine the effects of peer delivered self-monitoring strategies on a set of classroom survival skills of five students with severe disabilities in general education activities. Also, we sought to determine teachers' and students' perceptions of change as a result of the intervention.

Methods

Participants

Students. Five middle school students classified a having severe disabilities according to Utah Stat guidelines participated in this study. The severe disability classification was based on a combination of factor including delayed cognitive functioning, speech and language difficulties, health problems, and adaptive behavior deficits. All received special education service in a self-contained setting, but participated in one o more general education classes. Both the students and their parents had expressed a desire to become more involved in general education.

Table 1 overviews the students' age, classification academic level, and other social concerns that affected their school day. Karol was slightly built and was often absent from school due to illness. Jewel was also frequently absent. Jerry was generally pleasant and happy but occasionally refused to talk and physically withdrew from others. Daniel was also generally happy and pleas ant and he never displayed aggression during any of his classes. However, he became overly physically aggressive two or three times during the school year. He punched, kicked, and wrestled peers to the ground, resulting in physical injury to others. These episodes went beyond the normal "play" of teenage boys. Last, Cindy was small in stature (4 ft 6 in.) and seldom spoke in complete sentences. When presented with a new situation such as a change in Sometimes, she stepped back from others, but at other times collapsed into a fetal position in the corner of a room.

All students were enrolled in general education classes to attain existing social and academic individualized education plan (IEP) objectives. Karol was enrolled in a sixth grade Spanish class. She was encouraged to join in such activities as the "color songs" and cutting out pictures to match with Spanish words. Jewel attended an eighth grade U.S. history class. The teacher of this class used cooperative groups extensively and Jewel participated in the creation of maps and discussions of events and people. Jerry and Daniel attended an eighth and seventh grade art class, respectively. Their involvement in class was similar to that of other students. During the course of the semester, they worked in several mediums such as crayon, charcoal, and clay. Cindy attended a sixth grade reading class. She watched videos of stories in print, listened to books being read by the teacher, and read her favorite books during sustained silent reading sessions. Although Cindy was capable of decoding words at the sixth grade level, her reading comprehension was at the first grade level.

Peer tutors. Each student was assigned an eighth grade peer tutor, who worked only with that student. Peer tutors were selected according to convenience of class schedules from a larger group of eighth grade students in the students' school. This larger group of peer tutors had basic training in the delivery of cues, praise,

Table 1
Student Characteristics

Name	Age	Classification[a]	Academic level	Other concerns
Karol	12-05	Severe intellectual disability	Received speech/language instruction Good conversational ability R: Decode at low 2 GE R: Comprehend at low 2 GE M: Tells time to half hour	Health care needs
Jewel	15-00	Severe intellectual disability	Good conversational ability R: Decode at low 2 GE R: Comprehend at low 2 GE M: Tells time to half hour	Frequent truancy
Jerry	14-10	Severe intellectual disability	Received speech/language instruction Good conversational ability R: Decode at low 2 GE R: Comprehend at low 2 GE M: Tells time to half hour	Episodic social and physical withdrawals
Daniel	12-05	Severe intellectual disability	Received speech/language instruction Good conversational ability R: Decode at low 2 GE R: Comprehend at low 2 GE M: Tells time to half hour	Episodic aggressive behavior
Cindy	12-01	Severe intellectual disability	Poor conversational ability R: Decode at low 6 GE R: Comprehend at low 1 GE M: Tells time to whole hour	Episodic withdrawal to fetal position

Note: GE = grade equivalent; R = reading ability; M = math ability.
[a] Utah State Office of Education guidelines.

and error correction for classroom skills. Each student receiving special education services was assigned a different peer tutor for every class period, whether in general education or special education settings. Each peer tutor received class credit for tutoring one class period each school day. The basic purpose of serving as a peer tutor was to act as a teacher's aide for the assigned student with disabilities in a particular class (general or special). Participating peer tutors in this study received specific training in self-monitoring instruction and data collection (see "Peer Tutor Training" section).

Setting

The study was conducted in a neighborhood middle school (approximately 800 students) in a small town in northern Utah. The school day consisted of seven periods of 44 minutes each. Typical general education classes comprised 30-35 students. Supports for special education students included a trained peer tutor and a content curriculum adapted for the needs of the students. Examples of support and adaptations include modified content, expanded explanations, assistance in organizing materials, assistance with class activities (e.g., cutting, drawing, reading), oral quizzes, and shortened assignments.

All observations of the dependent measures by the peer tutors and adult observers occurred in the general education classrooms. Before, during, and after the study, peer tutors sat or stood slightly behind and to the side of the students. This position allowed them to be close enough to observe or to help students when needed, but to withdraw so that the students would be on their own as much as possible. Observers sat at a distance from the peer tutor/student pair in order to note their interactions in relation to the other students, but close enough to hear their conversations. Generally, the last 10-15 minute period of each class was designated for individual student work. It was during this time that the peer tutors taught the students to self-monitor their behaviors. This training took place at the students' desks.

Classroom Survival Skills Measure, Definition, and Recording Procedures

The primary dependent measure for the study was the percentage of occurrence of classroom survival skills displayed by each student.

Skill selection and definitions. In order to identify classroom survival skills that teachers believed promoted classroom participation, general education teachers were asked to list characteristics that described their classroom routines. After this information was obtained, the first author interviewed the teachers and compiled a list of classroom participation behaviors that were expected of all students. The list was submitted to the teachers, who ranked the participation behaviors as either very important, important, or slightly important. To be included in the final list, a behavior had to be ranked as very important by three of the four teachers. This ranking resulted in 11 discrete behaviors (Table 2).

Each classroom survival skill was operationally defined in order to facilitate accurate observation and recording. "In class when bell rings" meant that, at the initiation of the class bell, students had to have both feet in the classroom. "In seat when bell rings" required that students be seated at their desk at the cessation of the class bell. "Bring appropriate materials to class" was slightly different for each class due to teacher requirements. In every class, students needed to bring a writing utensil, writing paper/notebook, and a daily planner, which had to be displayed on the desk within 2 minutes of the class starting bell. Some classes (U.S. history, Spanish, and Reading) required students to bring a textbook, whereas other classes (art) required specialized materials (colored pencils). Each teacher determined the appropriate materials required for each class.

"Greet the teacher" required a student to recognize the teacher by name at some time during the class period. "Greet other students" required the student to talk to and/or greet by name at least two other students during the class period. "Ask questions" and "answer questions" required students to ask at least one question of the teacher during the class period and to answer at least one question from anyone during the class period. Asking or answering any question on any subject qualified a correct response. For instance, asking "Are you OK?" or answering the same question was recorded as a correct response. Recording these behaviors could occur at any time during the class period.

Whenever the teacher addressed students, they were required to "sit up straight," "look at the teacher," and to "acknowledge the teacher." Students were determined to sit up straight when their spine was perpendicular to the floor while in a sitting position. Look at the teacher required that students focus their eyes on the face of the teacher. Acknowledge the teacher required that after the teacher addressed students, they

Table 2
Teacher Selected Classroom Survival Skills

1. In class when bell rings
2. In seat when bell rings
3. Bring appropriate materials to class
4. Greet the teacher
5. Greet other students
6. Ask questions
7. Answer questions
When addressed by the teacher:
8. Sit up straight
9. Look at teacher
10. Acknowledge
11. Record classwork in planner

would demonstrate that they had heard the teacher by nodding the head or by making a vocal response such as "yes," "OK," or "u-huh." Only one correct response was required for these behaviors in a particular class period and the behaviors could be recorded at any time during the class period. Finally, "record classwork in planner" required students to write something relating to the class in the daily planner. Students could write any comment that they chose about the class that day. Due to the limited writing skills of some of the students, a one word statement was accepted as a correct response and it had to be recorded by the student before leaving the classroom.

Data collection. Peer tutors recorded the occurrence of classroom survival skills displayed by the students during the classroom period, using a form similar to that used by the students to self-monitor. The self-monitoring form listed each survival skill with a line drawing of the behavior and its label in a column on the left side of the sheet and a column on the right of the page with a Yes and a No box to self-record behaviors. The peer tutors' recording form contained two additional items: (a) a list of the seven instructional steps to be used during the training phase and (b) an additional column to compute student/peer tutor agreement during all conditions. Peers tutors recorded their delivery of instruction during training and the student classroom survival skills performance during all conditions. The peer tutor observed the student's behavior during the entire class period. During baseline and maintenance, data were collected on "independent" or unprompted responses, which were defined as performance of the survival skill without help or direction within the class period. Peer tutors were not allowed to prompt the student during these conditions. During training, the peer tutor recorded survival skills, either prompted or unprompted. An example of a prompted response would be the student engaging in a target behavior within 3 sec of a direction given by the peer tutor.

Interobserver agreement. Two adult paraprofessionals were trained to collect data on student behavior to determine the accuracy of peer tutor recording. The observers worked with the first author until they could correctly identify and record survival skill performance by the students with 100% accuracy. The observers used a form similar to that used by the peer tutors, with the addition of a section used to compute agreement for student classroom survival skills performance and peer tutor self-monitoring instruction delivery.

Observers were present in at least 20% of baseline and maintenance sessions and 100% of training sessions. During these sessions, the observer would sit or stand to the side and rear of the student/peer tutor pair. This allowed the observer to see and. hear the actions and interactions of both. At the conclusion of the session, the observer compared the peer tutor survival skills performance recordings with the recordings of the survival skills performed. Matches were divided by the total number of survival skills and multiplied by 100 to obtain a percentage measure of agreement. Interobserver agreement data on student behavior by student and experimental condition is presented in Table 3.

Self-Monitoring Measures and Recording Procedures

The secondary dependent measure was the accuracy of students' self-monitoring of their classroom survival skills performance. To determine the accuracy of student self-monitoring, the student self-recording was compared with the observational recording of the peer tutor. The occurrence of self-monitoring accuracy was expressed as a percentage of the number of matches (agreement between student and peer tutor on the survival skills performed) divided by the total number of classroom survival skills (total number of survival skills that could have been performed). For instance, if there were seven matches of student self-records and peer tutor records, then 7 would be divided by 11 and multiplied by 100 to arrive at a percentage. These data were computed daily and collected to provide a measure of the student's self-monitoring accuracy (Table 4)

Data collection. Data were taken by students and peer tutors. Students self-monitored their performance of the selected classroom survival skills during the training and maintenance conditions (Table 4). Students determined whether they had performed the survival skill or not and marked either a Yes or No. Each student self-recorded during the class period only. As

Table 3
Interobserver Agreement and Procedural Fidelity

Condition	Percentage of sessions observed by observer	Percentage of observer/peer tutor agreement (range)	Procedural fidelity percentage (range)
Karol			
B	25	100	—[a]
T	100	96(82-100)	100
M	46	99(91-100)	—
Jewel			
B	22	100	—
T	100	96(82-200)	100
M	43	99(91-100)	—
Jerry			
B	35	100	—
T	100	98(91-100)	97(86-100)
M	35	99(91-100)	—
Daniel			
B	30	91 (82-100)	—
T	100	100	98(86-100)
M	21	97(91-100)	—
Cindy			
B	36	99(91-100)	—
T	100	91 (82-100)	97(86-100)
M	83	98(91-100)	—

Note: B = data, T = training; M = maintenance.
[a] No data, data rounded to the nearest whole percentage.

Table 4
Student Performance, Student Self-Monitoring, and Self-Monitoring Accuracy

Condition	Classroom survival skills performance[a]	Student self-monitoring[b]	Student/peer tutor agreement (range)
Karol			
B	32	—[c]	—
T	68	69	94(73-100)
M	85	86	99(91-100)
Jewel			
B	33	—	—
T	82	82	87(73-100)
M	91	96	94(82-100)
Jerry			
B	20	—	—
T	91	96	91(64-100)
M	95	97	97(82-100)
Daniel			
B	30	—	—
T	90	91	100
M	88	97	91(73-100)
Cindy			
B	13	—	—
T	76	82	95(82-100)
M	77	99	79(46-100)

Note: B = baseline; T = training; M = maintenance.
[a] Data collected by peer tutor.
[b] Student self-recorded data.
[c] No available data, data are rounded to the nearest whole percentage.

previously described, peer tutors collected data on the students' performance of survival skills using a form similar to that used by the students.

Peer Tutor Training

Peer tutors were taught to deliver self-monitoring instruction to the students using Lovitt's (1992) self management training package. Instruction in self-monitoring was given to all selected peer tutors prior to baseline for 8 weeks in twice weekly 20 minute blocks. The peer tutors were taught to observe and record survival skills and to teach students with disabilities to self-monitor. Instruction included viewing a training video, completing a study guide, interacting in small groups, role playing, developing sample self-monitoring systems, and reviewing examples and nonexamples of survival skill instruction of students with disabilities. Self-monitoring instruction delivery for peer tutors was complete when they demonstrated 100% mastery of the skills taught over three consecutive training sessions and delivered self-monitoring instruction appropriately based on a list of seven discrete actions. The peer tutors had to demonstrate that they could (a) explain why performing the survival skills was in the student's best interest, (b) give a rationale for self-monitoring, (c) explain how to count and self-record survival skills, (d) give one example for each survival skill, (e) give one nonexample for each survival skill, (f) provide prompts when necessary, and (g) provide feedback and praise. The peer tutor could refer to a script to make sure that instruction was complete and comprehensive. Once peer tutors demonstrated mastery, they taught students to self-monitor in the general education classroom.

Experimental Design and Conditions

A multiple baseline across subjects design was used to evaluate the effects of peer delivered self-monitoring instruction on the percentage of occurrence of students' classroom survival skills.

Baseline. During baseline, the peer tutor served as an aide to the teacher, but did not praise or correct the student for demonstrating or not demonstrating any of the targeted classroom survival skills. During this time, the peer tutor observed and recorded the frequency of the student's classroom survival skill performance. Students sat in their normal seating during all observations.

Peer delivered self-monitoring intervention. The students were taught by peer tutors to self-monitor in the general education classroom. Generally, teachers used the first 30 minutes to review previous instruction, provide new instruction, and initiate guided practice for the students in class. During the last 10-15 minutes of a class period, peer tutors and students worked together on classwork. It was during this last period of the class that the peer tutors taught the student how to self-monitor.

Specific steps were followed by the peer. tutors in instructing the students. First, peer tutors introduced and discussed with students how students would learn to keep track of their own behavior. Each behavior was introduced and reviewed. For example, the peer tutor said something like, "It is important to pay attention to the teacher when she talks to you. I am going to show you how you can teach yourself to pay attention to the teacher." By self-recording, it was expected that students would become aware of how often they performed the classroom survival skill. Second, the peer tutor gave examples ("You need to look at the teacher when she says your name") and nonexamples ("Looking at the floor is not paying attention to the teacher") of each classroom survival skill. Third, the peer tutor taught the student how to correctly use the self-recording sheet. Peer tutors asked students if they had performed an individual classroom survival skill (e.g., in class when bell rings). Whatever students reported about their performance of the survival skills, the peel tutor instructed them to mark the appropriate box. They marked Yes for completed or No for not completed.

During the training session of the class period, peer tutors praised the students for already self-recording their behaviors. If the student had not yet performed survival skill (e.g., talking to other students), the peer tutor would encourage the student to do so. Although peer tutors gave students feedback and praise, they did

not specifically direct how students were to mark their self-monitoring sheet. The peer tutor also encouraged the student to ask as many questions as needed, without creating a disturbance. Students were taught that they could record their behavior at any time during the class period, but that they must complete their self-recording before leaving the classroom. Training in self-monitoring continued at the same time each session until the student self-recorded 9 of 11 survival skills for three consecutive sessions.

Maintenance. After the student demonstrated self-recording mastery, as determined by peer tutor observation data, direct intervention was withdrawn. No further prompts, praise, or feedback were given for the display of survival skills. Without comment, the peer tutor continued to give the student a self-monitoring sheet at the beginning of each class period. Maintenance data were taken daily by the peer tutor through direct observation. It was expected that a student's performance might increase after training, but decrease at some point during the maintenance condition. When a student's classroom survival skill performance dropped below 80% for two consecutive days, the peer tutor retrained the student. During retraining, the peer tutor again provided praise for self-recording and encouraged survival skill performance if needed. Once the student's self-recording of classroom survival skills increased to 80% or higher for two consecutive sessions, retraining was discontinued and the peer tutor discontinued feedback.

Procedural Fidelity

The same two adult observers who conducted interobserver agreement checks were also trained to collect procedural fidelity. Peer tutors were observed in 100% of the training sessions by the observers to determine the level of each peer tutor's fidelity to the required self-monitoring instructional procedures. Correct self-monitoring instruction consisted of delivering the following seven steps to the student: (a) explaining why performing the survival skills was in the student's best interest, (b) giving a rationale for self-monitoring, (c) explaining how to count and self-record survival skills, (d) giving one example for each survival skill, (e) giving one nonexample for each survival skill, (f) providing prompts when necessary, and (g) providing feedback and praise. If a peer tutor skipped or incorrectly delivered two or more of the seven steps (less than 86% correct delivery) in a session, that peer tutor was required to retrain with the first author to the original level of required proficiency. None of the peer tutors in this study required retraining. The level of procedural fidelity was determined by dividing the number of correctly delivered steps by the total number of steps and multiplying by 100 to obtain a percentage. Procedural fidelity data are reported in Table 3.

Social Validation

Social validation data were obtained from two sources. First, each general education teacher was asked at the end of the maintenance condition to rate on a 5-point Likert-like scale *(1 = a great deal, 3 = some,* and 5 = *none)* the change in participation of the student in the general education classroom. The teachers were also asked to describe the students' survival skills behavior in the classroom and to determine if the self-monitoring instruction disrupted the class routine. Second, students were asked before the training condition, as well as at the end of the maintenance condition, to rate on a 5-point Likert-like scale (1 = *everyday,* 2 = *almost everyday,* 3 = *usually,* 4 = *sometimes,* and 5 = *never)* their participation in the general education class. Students were also asked at the end of the maintenance condition if they believed they fit into the general education class.

Results

Classroom Survival Skills

Figure 1 shows the percentage of occurrence of classroom survival skills across the baseline, training, and maintenance conditions. Table 5 reports mean performance for each classroom survival skill for each student per condition.

Baseline. All students demonstrated a stable pattern during baseline. Although students responded differentially across individual target behaviors, composite scores across all target behaviors revealed stable baseline levels with minimal variability. Additionally, although there were breaks in data collection for four of the five students, performance levels remained unchanged. Mean performance levels across the students ranged from 13% to 32%. Mean performance levels for Karol, Jewel, and Daniel were similar (range of 30%-32%). Jerry's mean performance level was 20% and Cindy's mean performance level was 13%.

Training. Once the peer mediated self-monitoring intervention was applied, strong changes in performance levels were evident for all students (Figure 1). Three students (Jerry, Daniel, Cindy) demonstrated immediate changes in performance level after intervention. Gradual but steady changes in trend occurred for Karol and Jewel. Cindy's mean performance level was 76%, Karol's mean performance level was 68%, and the other three students achieved at least an 80% level. Additionally, although two students (Karol, Jewel) were absent for several days during training, these absences did not negatively affect their performance. Of particular interest is that all students achieved a 100% performance level during this condition. Of the 11 classroom survival skills observed, positive changes occurred for all students (Table 5). Positive changes were evident across all target behaviors for two students (Jerry, Daniel), in 9 of the 11 behaviors for two students

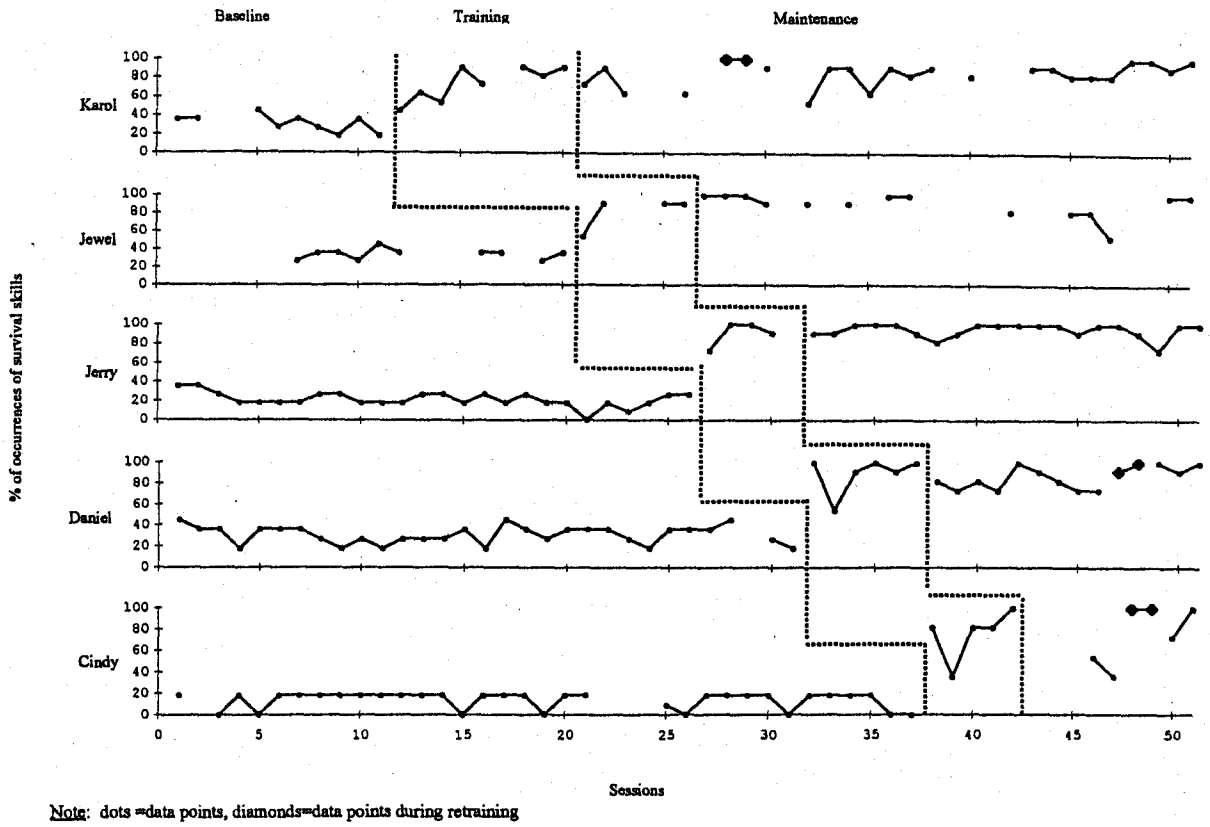

Figure 1. Percentage of occurrence of survival skills across students.

(Cindy, Jewel), and in 7 of the 11 behaviors for one student (Karol).

Maintenance. Maintenance levels for all students were comparable to their performance levels during the training condition. Although Karol, Daniel, and Cindy required retraining, only 2 days of retraining by the peer tutors were needed to produce immediate increases. Jewel and Jerry's performance levels decreased on one occasion each, but both increased the next session without retraining. With the exception of Cindy, who had too few data points for a stable pattern, the data demonstrate a stable and high level of performance across students.

Student Self-Monitoring and Self-Monitoring Accuracy

Students self-monitored their performance with prompting during training and retraining, but without prompting during maintenance. Although students' self-recorded data were higher than the mean levels reported by the peer tutors, the differences were generally negligible (Table 4). Neither students, peer tutors, nor observers reported any problems by students in self-monitoring or self-recording their behavior.

Teacher Rating of Student Participation Change

The general education teachers believed that the students had positively changed in their participation of classroom survival skills (Table 6). Although teacher perceptions of student behavior change differed considerably across students and skills, "a great deal" to "some" change was reported most frequently. However, Karol's teacher said there did not appear to be any change in the fit of the student in her classroom and she stated "not at all" to the question concerning disruption caused by self-monitoring in the classroom.

Jewel's teacher did not address the question of Jewel's fit in the classroom. He did report that there was no disruption in his classroom routine due to the self-monitoring training. Jerry's teacher, when responding to the question regarding any change in fit for Jerry, reported: "I don't see any consistent change - in fact he responds appropriately only when reminded." The teacher indicated that

Table 5
Mean Percentage of Student Performance of Survival Skills by Condition

Condition	Survival skills										
	1	2	3	4	5	6	7	8	9	10	11
Karol											
Baseline	100	100	0	0	0	13	13	0	88	38	0
Training	100	100	89	44	0	68	44	78	68	56	89
Maintenance	100	100	90	80	10	65	70	100	100	90	100
Jewel											
Baseline	78	67	11	0	0	0	0	11	100	100	11
Training	100	75	50	50	50	25	100	75	75	75	75
Maintenance	100	100	83	83	83	68	68	100	92	92	100
Jerry											
Baseline	84	84	4	0	0	4	0	8	52	4	0
Training	100	100	75	50	75	100	100	100	100	100	100
Maintenance	94	94	100	50	100	94	94	100	100	94	100
Daniel											
Baseline	93	93	0	0	0	30	59	0	44	30	0
Training	100	100	100	80	80	100	80	80	100	100	100
Maintenance	100	100	93	93	86	64	86	57	93	86	100
Cindy											
Baseline	77	74	0	0	0	0	0	0	0	0	0
Training	75	75	100	100	75	50	50	75	50	50	75
Maintenance	100	68	68	83	68	68	83	83	83	83	67

Note: 1 = In class; 2 = seated; 3 = materials; 4 = greet teacher; 5 = greet students; 6 = ask questions; 7 = answer questions; 8 = sit up; 9 = look at teacher; 10 = acknowledge teacher; 11 = record in planner.

Table 6
Rating of Teacher Perception of Change in Participation of Student

Survival skills	Students				
	Karol	Jewel	Jerry	Daniel	Cindy
1. In class when bell rings	1	3	5	1	1
2. In seat when bell rings	1	1	5	1	1
3. Bring appropriate materials to class	1	1	4	2	1
4. Greet the teacher	1	2	5	1	1
5. Greet other students	3	4	5	4	2
6. Ask questions	3	4	5	1	4
7. Answer questions	3	5	5	1	3
When addressed by the teacher:					
8. Sit up straight	1	1	3	1	2
9. Look at teacher	1	1	5	1	2
10. Acknowledge	1	1	5	1	1
11. Record classwork in planner	2	3	5	3	3

Note: 1 = a great deal; 3 = some; 5 = none.

"he creates a lot of disturbance. He does not work at all." She also stated, "I feel he has not benefited from the experience, nor has the class." The teacher did not report whether the self-monitoring training had caused any disruption in the classroom routine.

Daniel's teacher reported: "Daniel has done very well. He learns and has followed through with constant improvement. He has worked well and tries to please. He is always happy and positive. Other kids have learned from him." She ended her statements by saying, " A great experience!"

Cindy's teacher reported: "She seems less frightened. She knows what is expected of her. She follows directions better." This teacher reported that there were no disruptions in her classroom routine due to the self-monitoring training.

Students' Perception of Change of Participation in Classroom Survival Skills

Before baseline, students were asked to rate their participation in the general education class. All students rated themselves as participating more in the classroom after training (Table 7).

Karol originally rated her participation in the general education class halfway between "almost everyday" and "usually." At the end of the maintenance period, she believed that she participated "everyday." She believed

Table 7
Student Perception of Change in Survival Skills Participation

	Students									
	Karol		Jewel		Jerry		Daniel		Cindy	
Survival skills	Pre	Pst	Pre	Pst	Pre	Pst	Pre	Pst	Pre	Pst
1. In class when bell rings	1	1	1	1	1	1	1	1	5	4
2. In seat when bell rings	1	1	4	1	1	1	1	1	1	1
3. Bring appropriate materials to class	1	2	1	2	1	1	1	1	1	2
4. Greet the teacher	5	2	4	2	1	3	1	1	3	4
5. Greet other students	5	3	4	1	1	1	1	1	2	1
6. Ask questions	4	1	5	1	1	1	2	1	3	3
7. Answer questions	4	2	5	1	1	1	3	1	4	4
When addressed by the teacher:										
8. Sit up straight	2	1	5	2	1			1	2	1
9. Look at teacher	1	4	1	1	1	1	1	1	4	1
10. Acknowledge	2	4	4	1	5	3	3	1	1	4
11. Record classwork in planner	4	1	5	1	3	1	1	1	3	1

Note: Pre = preintervention; Pst = postmaintenance; l = everyday; 2 = almost everyday; 3 = usually; 4 = sometimes; 5 = never.

that she fit in the class because "I get to know the kids. We get to play games."

Before beginning the study, Jewel rated her participation halfway between "usually" and "sometimes." At the end of maintenance, she rated her participation as "everyday." She believed that she fit in the class because "I have friends and it's fun."

Jerry's preintervention participation rating was halfway between "everyday" and "almost everyday." His end of maintenance rating was only slightly more toward the "everyday." He believed that he fit in the class because "I am a student in there. They make me feel welcome."

Daniel originally rated his participation in the general education classroom as halfway between "everyday" and "almost everyday." After training and at the end of maintenance, he rated himself as participating in all survival skills as "everyday." He also wrote that he fit in the classroom because "I like to be with them. I like to have fun."

Before baseline, Cindy rated herself as "usually" participating. After training, she gave herself a rating halfway between "almost everyday" and "usually." Similar to all the other students, Cindy said that she fit in the classroom.

Discussion

The study investigated the effects of peer delivered instruction in self-monitoring strategies on the performance of students with severe disabilities in the general education classroom. Also, the social impact of the instruction and self-monitoring on teachers and their students with disabilities in general education classrooms was examined. Positive changes were reported for all participants. To be successful in general education classrooms, students with disabilities need to be provided with appropriate educational supports. In the present study, self-monitoring represented an effective educational support to use in the classroom. The students were taught a repertoire of classroom survival skills that were associated with school success. As Copeland et al. (2000) indicated, few studies have appeared in the research literature on the acquisition of academic or study skills by students with severe disabilities. Research is needed on providing academic support for students in general education. The present study contributes to that area. Last, there are few published studies on peer mediated self-monitoring studies. The present study strongly documents that peers can be used to teach students with severe disabilities to self-monitor their behavior.

Agreement data on student performance between peer tutors and observers, collected across 46% of all sessions, revealed a high level of agreement (Table 3). These data suggest that with systematic instruction, students with severe disabilities can collect reasonably accurate data on their own behavior. This finding supports previous research that suggests that students with severe disabilities can accurately monitor their behavior (Wehmeyer et al., 1998).

As previously mentioned, all the students in this study dramatically increased their performance of the teacher chosen behaviors in those teachers' classrooms. The teachers observed the change in their students' participation. Cindy's teacher reported that Cindy was less frightened to be in the class, she followed direction better, and she had a better realization of what was expected. However, teachers perceived the extent of change in participation by some students differently than indicated by the target behavior data. This is evident for two students in particular. Jewel's mean target behavior performance rose from 33% during baseline to 91% during maintenance, but her teacher rated Jewel's change in participation as only slightly more than "some." The fact that Jewel missed nearly 1 of every days of school may have influenced the teacher's ratio

of her participation. The second student, Jerry, had a mean target behavior performance during baseline of 20%, which rose to a mean of 95% during maintenance. He had the highest mean target behavior of all the students. Despite this achievement, Jerry's teacher rated his change in class participation as nearly nonexistent and that she saw no consistent change in Jerry. She also reported that he created a lot of disturbance in the class and that neither Jerry nor the other class members benefited from the experience of self-monitoring instruction. These discrepancies warrant serious attention. Two explanations can be presented. First, although the target behaviors were validated by the cooperating teacher, the fact that Jewel had excessive absences and that Jerry engaged in disruptive behavior provided their cooperating teachers with a history of aversive events. Consequently, it may not be surprising that they did not agree with the observational data reported. In hindsight, further discussions with the cooperating teachers would have been helpful as it would have been beneficial to have learned more about how the teachers responded to these behaviors. Second, the behaviors had been identified as important. However, if they did not directly change the way the target students responded to the typical classroom routine, positive changes may not be salient enough to warrant appreciation. When identifying instructional targets, it is necessary to consider both the functional value of the behavior (i.e., the extent to which it makes the student more competent) and its integrative value (i.e., the extent to which it facilitates the student's fit in the class).

None of the teachers reported any problems with peer tutors delivering instruction to the students. This suggests that peer tutors represent viable options for delivering support and services in the general education environment. The data indicate that using peer tutors to instruct students with severe disabilities in self-monitoring increased those students' participation in the classroom and that this change in classroom participation was recognized by the teachers of four of the five students.

Another aspect of determining the social validity of this study is the impact on the students. All students reported that their fit in the classroom had improved after they learned to self-monitor. They indicated that they fit in the general education class because they had friends there, they were liked, and they had fun in the class. They rated themselves as participating to a greater extent after instruction in self-monitoring than before that instruction. Student reports concerning individual target behaviors demonstrated that students recognized differences in their performance of behaviors before and after instruction in self-monitoring. Additionally, teacher ratings of the students were generally in agreement with both the observational data and the students' ratings. Changes in participation ratings suggested that the students recognized that their behavior had changed. Greater self-awareness may indicate a move by the students toward enhanced self-determination.

The study makes several contributions to the literature on inclusion and self-determination. First, self--monitoring has been recognized as the initial step in self-management training and is an important characteristic to promote self-determination (Agran, 1997; Wehmeyer et al., 1998). Investigations of the effects of this strategy on inclusive environments remain limited. Few self-monitoring studies involving peer support are found in the literature and few have investigated the effects of self-monitoring on the academic or study skills of students with severe disabilities. Also, teaching a student with severe disabilities to self-monitor may greatly enhance generalization from training to performance settings. Self-monitoring represents an instructional strategy that allows students to assume more ownership of their learning. Rather than getting feedback from others, self-monitoring allows students to literally observe themselves. Self-monitoring represents an effective instructional support for the student in the inclusive setting. Further, using peers to teach student directed learning strategies serves an important function. Second, no other study reported the reaction of general education teachers to the change in participation of students with severe disabilities in their classrooms when those students were instructed in self-monitoring techniques. It is critical that the opinions of all integral stakeholders be obtained as we include students in general education programs. Without this information, the impact of the study remains uncertain.

Despite the study's strong findings, there were several limitations that warrant attention. The participants in this study dramatically increased their performance of their target behaviors after peer instruction. However, there is no way to compare the performance of the participants with that of students without disabilities. In this study, participants increased their performance of target behaviors chosen by general education teachers, but this study does not indicate whether the students' participation when compared with that of peers without disabilities was within an acceptable range. It is also possible that the reported behavior change was due to the increased attention the student received from the peer, independent of the strategy taught. However, the students had interacted with the peers prior to the initiation of the study, so a novelty effect was minimized. Most importantly, their behavior changed consistently after instruction in self-monitoring had been provided. It is conceivable that if the students were told to self-monitor, they may have done so without peer instruction. We suggest that this is highly unlikely because one of the difficulties in teaching students to monitor their own behavior is that they have had little experience in self-observation (Agran, 1997). However, it is possible that one or more of the students could have learned the

procedure independently, and this represents a limitation of the study. Further, increasing the number of sessions may have provided more confidence to the findings of this study. Correspondingly, starting the study earlier in the school year would have provided the time needed for an extended maintenance condition for Cindy. Extra sessions would have allowed Cindy to demonstrate the extent and maintenance of any change in her behavior.

Last, in this study, there were three groups of participants: students, teachers, and peers. Data were taken and analyzed about the effects of the study on the students and the teachers, but no data were taken on the effects on the peers. There are numerous studies that indicate that peers receive positive benefits academically as well as socially from their interaction as tutors (Allen, 1976; Gordon & Gordon, 1990). There were no means in this study to determine the effects (e.g., social knowledge) on the peers of delivering instruction in self-monitoring to students with severe disabilities. Additional research in this area is clearly warranted.

In summary, this study suggests that self-monitoring is an effective tool to assist students with severe disabilities to participate more fully in general education settings. Students in this study reported that they felt that they were a part of their general education classrooms and indicated that they were aware of an increase in their classroom participation. Teachers generally reported that the students demonstrated increased participation after receiving instruction in self-monitoring for specific participation behaviors. Although the findings were encouraging, they are specific to a particular student-directed learning strategy and to a specific set, of behaviors in a restricted number of settings. Further research needs to investigate the effects of other student directed learning strategies (e.g., problem solving, self-instruction) on other behaviors associated with inclusive practice (e.g., notetaking, homework completion). Based on the findings of the present study and the emerging literature on student directed learning, we believe that these strategies may greatly promote the participation and inclusion of students with severe disabilities in general education.

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