

## Integration and Environmental/Outdoor Education: The Impact of Integrating Students with Severe Developmental Disabilities on the Academic Performance of Peers Without Disabilities

By: [Stuart J. Schleien](#), Debra A. Hornfeldt, and Leo H. McAvoy

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### **Abstract:**

This study assessed the amount of environmental information which nondisabled children acquired while participating in a 1-day integrated outdoor education experience with children who were severely developmentally disabled. Learning gains of 88 second and third grade children were assessed using a pre-, post-, and re-test design. Results indicated that all nondisabled children in integrated classes showed statistically significant gains in learning environmental education concepts: These results suggest that the presence of learners with developmental disabilities does not have detrimental effects on the learning gains of nondisabled children. Recommendations are made concerning strategies for integrating children with disabilities into outdoor education programs.

**KEY WORDS:** Developmental Disabilities, Inclusion, Integration, Learning, Outdoor Education, Severe Handicaps

### **Article:**

Historically, many education, recreation, and outdoor education programs serving children with developmental disabilities have not been characterized by equity or excellence as compared to services for nondisabled individuals. In the past, skill development for these children has occurred most often in either self-contained schools or residential environments (Schleien, Heyne, Rynders, & McAvoy, 1990). Currently, however, federal mandates [e.g., Public Law 101-476, Individuals with Disabilities Education Act (IDEA), and Public Law 101-336, the Americans with Disabilities Act (ADA)] prohibit discrimination against children with developmental disabilities. These legislative mandates have paved the way for children with developmental disabilities to live, learn, and recreate in settings with their nondisabled peers.

In the past decade, successful social integration in various settings where children with and without developmental disabilities participate together in a social, peer-like, and friendly manner has been made possible. "Promising practices" across home, school, and community environments have facilitated many positive learner outcomes. These practices include: (a) cooperative learning strategies (Schleien, Fahnstock, Green, & Rynders, 1990), (b) environmental analysis inventorying (Certo, Schleien, & Hunter, 1983), (c) strategies for partial participation (Ford et al., 1984), (d) trans-agency networking (Schleien & Ray, 1988), (e) circle of friends methods (O'Brien, Forest, Snow, & Hasbury, 1989), and (f) careful selection of activities and environments for the integration experience (Rynders & Schleien, 1991). When designed carefully, inclusive education, recreation, and outdoor education programs have yielded collateral benefits across curriculum domains. Improvements in communication, physical fitness, and social behavior have been shown to develop or improve in conjunction with targeted recreation or academic skills in integrated environments (Schleien, Heyne, & Dattilo, in press).

The elimination of many previously perceived and real constraints to integrated programs has been achieved; such as, skill limitations within learners with disabilities (i.e., intrinsic barrier) and architectural and trans-

portation bathers (i.e., extrinsic barriers). A substantial hurdle that persons with disabilities and their advocates must overcome, however, still remains. Negative attitudes among teachers, administrators, nondisabled children, and their parents continue to be major constraints to successfully integrated programs (Rynders & Schleien, 1991). Specifically, the question, "What impact will the inclusion of students with developmental disabilities in general education classes, generic recreation programs, and regular environmental/outdoor education environments have on the learning process of peers without disabilities?" is being asked at an accelerated pace by administrators, board members, teachers, parents, recreation professionals, outdoor educators, and other members of education and recreation communities (Vandercook, York, & MacDonald, 1991). It is the opinion of many social psychologists and other researchers that the presence of a child who is developmentally disabled in an integrated program will disrupt or put at risk the learning process for those children who are not disabled and that the nondisabled children will not learn as much because the entire group will be held back.

A look at theory and past research may help give a better sense of understanding regarding the potential impact the presence of a child with a disability may have on the learning of other children. Lewin's (1935) social psychology theory held that behavior is a function of the person and the environment. Deutsch's (1949, 1962) social interdependence theory, based on Lewin's, holds that each individual's outcomes are affected by the actions of others in the group. Bandura (1977) expanded Lewin's theory and developed a social learning theory where learning is closely tied to the environment created by others in the learning group.

So, theory would suggest that members in an educational group may influence one another. What does research indicate about the affect of children with disabilities on an educational group? Rosenbaum (1980) cited evidence from several sources, including extensive literature reviews, which indicates that positive, mixed, and negative effects of mixed ability groupings on academic achievement can be shown for ability level. Stephens (1967) reviewed literature from a number of sources indicating that creation of mixed ability groups has no positive or negative differential effect on pupil achievement. Johnson and Johnson (1989) cited a number of their studies which have demonstrated the positive educational outcomes for all children in heterogeneous groups when cooperative goal structuring is used. Research in developmental psychology has shown that in mixed educational settings which require social interaction, cognitively immature children make substantial gains in cognitive growth at no cost to the cognitive status of cognitively advanced children (Murray, 1982).

Reid, Clunies-Ross, Goacher, and Vila (1981) have suggested that the most widely endorsed disadvantage of mixed-ability groups is the reduction in the motivation and achievement of individuals with greater abilities. However, other researchers have found that normally developing children attending integrated education and recreation programs made expected progress in areas of language, cognitive, motor, perceptual, and social development (Bates & Renzaglia, 1982). This controversy continues to exist as many teachers and administrators accept the opinion that children with developmental disabilities disrupt and cause problems for children without disabilities in mixed-ability inclusive environments, even though there is no conclusive research evidence to support this opinion.

The purpose of this case study was to address the effects that the presence of children with severe developmental disabilities had on their nondisabled peers in an integrated environmental/outdoor education program. Specifically, the amount of environmental information that nondisabled children acquired while participating in a 1-day integrated environmental/outdoor education experience with children with severe developmental disabilities was assessed. Evaluating the amount of curriculum information acquired by nondisabled children in integrated settings will increase the understanding of how the presence of children with developmental disabilities effects the learning and academic performance of nondisabled children.

## **Methods**

This study integrated children with severe developmental disabilities into outdoor education programs and measured the effects of this integration on the learning of their nondisabled peers. A pre-, post-, and re-test research design was used to determine the amount of learning which occurred over time in an integrated group

of students.

**Subjects and setting.** Subjects were drawn from participants attending Belwin Outdoor Education Laboratory (hereafter referred to as Belwin), a part of the St. Paul (Minnesota) public school system. Located 20 miles outside of a large metropolitan area, Belwin's mission is to provide a comprehensive K-6th grade environmental education program for the area schools while preserving the natural resources within the center grounds. Students usually attend Belwin for approximately 4 hours 1 day each year. Approximately 2,400 nondisabled second and third graders currently attend Belwin during each school year. In addition, children with severe mental and/or physical disabilities also visit Belwin each year. Most are students at Bridgeview School, a segregated school in the St. Paul public school system which serves children with severe mental and/or physical disabilities. Programs serving regular and special education students are usually conducted at separate facilities within the nature center.

The children with severe developmental disabilities who participated in this study functioned in the severe to profound range of mental retardation. All but one of these children were non-verbal and communicated with either simple signs or symbols. They often displayed behaviors which were disruptive for the groups with whom they were integrated. These targeted behaviors included hair-pulling, sudden outbursts, hand-flapping, undressing, or sitting down and refusing to move. All of these children were evaluated by the St. Paul Public Schools as severely developmentally disabled, and several of the students possessed multiple disabilities.

During the 3-month study period, 8 study days were selected at random. The second and third graders from five elementary schools throughout St. Paul scheduled to visit Belwin on the sampling days were contacted and asked to participate in the study. All children in the classes agreed to be part of the study. These children were in classes that did not include children with severe developmental disabilities, nor was there any indication that these children had previous experience with children with severe developmental disabilities. In addition, after parent and teacher consultations, five children with severe mental and/or physical disabilities from Bridgeview School were selected to be part of the study. Eighty-eight children without disabilities were integrated with five children with severe developmental disabilities and participated in a food chain program.

A total of 93 children participated in the study. Of these, 88 were children without disabilities and 5 children had severe multiple disabilities. These five children visited Belwin on 3 separate days when 88 children without disabilities were evaluated by a pre-and post-test. These 88 children without disabilities were divided into 11 integrated groups with an average group size of nine students. At least one child with a disability was assigned to each group. This ratio of about one child with a disability to nine children without disabilities within the study groups approximates natural proportions in the community. Children were randomly assigned to these learning groups. The groups were each assigned a naturalist for the day who provided the lesson content and activity direction.

**Curriculum.** The food chain program was a regular part of the Belwin curriculum. It is approximately 4 hours long and contains an indoor presentation of material, demonstrations, and an outdoor component consisting of a naturalist-led hike and a search for items in the food chain. Children on all the study days were divided into groups of 9 to 12 students, and each group was assigned to a trained naturalist. The naturalists were provided with an outline of activities to be taught on the days when data were to be collected and were trained in the curricular materials so that each naturalist was presenting the identical material during the curriculum, using the same procedures. Naturalists were provided with background knowledge by a Certified Therapeutic Recreation Specialist (CTRS) about the children with severe developmental disabilities. A combination of integration strategies adapted to outdoor education settings was used, including companionship training, cooperative learning, and the use of trainer advocates (Rynders & Schleien, 1991; Schleien & McAvoy, 1989; Schleien & Ray, 1988). Staff naturalist training meetings were held so that activities could be presented cooperatively, insuring that all children had opportunities to interact with each other. Staff members were encouraged to ask questions of the CTRS and discuss any difficulties they had during the program.

Procedures. Prior to meeting their peers, all the nondisabled children were instructed on how to interact with children with disabilities. Through telephone conversations, classroom teachers were provided with information about the children with disabilities to share with their nondisabled students. The investigators answered any additional questions that the nondisabled children had prior to the arrival of children with developmental disabilities who eventually joined their integrated Belwin group. The nondisabled children were given the pre-test prior to the arrival of the children with disabilities. At the end of the day, the children with developmental disabilities left the groups during the test period. A second post-test was administered to 42% of the nondisabled children from four randomly selected classroom groups approximately 2 months following their Belwin visit. A lack of research funding precluded the researchers from conducting the follow-up test with all students from all groups.

Special education teachers served as trainer advocates for the students with disabilities and attended Belwin on the integrated days. This role included assisting in the integration process by teaching (i.e., verbal prompting, modeling) the nondisabled students how to interact with their peers with developmental disabilities, assisting in managing behavior problems, and assisting the naturalist as necessary (Robb, Havens, & Witman, 1983; Schleien, McAvoy, Lais, & Rynders, in press). Teachers were trained by the investigators and were provided with written summaries of their roles as trainer advocates. The investigators met with the trainer advocates prior to the study to clarify their roles and answer any questions they had.

Instrumentation and data collection. A 15-item paper-and-pencil test was developed to test the nondisabled children's knowledge regarding food chains. The test was developed by the Belwin Educational Director and staff to provide the researchers with information on the learning gains on the food chain activity for the second and third graders who attended Belwin. It was evaluated for content validity by four professional naturalists and five outdoor education graduate students. The instrument was pilot-tested at Belwin prior to data collection. The test was not viewed by the naturalists who were leading the food chain program prior to the days when testing took place. This was to prevent the naturalists from attempting to teach for the test and bias the results. The paper-and-pencil test was administered to the 88 second and third graders at the Belwin site immediately prior to the food chain activity (pre-test), immediately following the activity (post-test), and to 37 (42%) of the children approximately 2 months after the program (follow-up test). The follow-up test was administered by the same researcher who administered the pre-and post-tests.

The five naturalists teaching the integrated activity were asked to provide their opinions concerning the day's events. A qualitative assessment using a 10-item questionnaire at the program's conclusion was used for this purpose. Questions focused on the strengths and problems associated with integrating children with severe developmental disabilities into their programs. Representative questions included: "Do you feel that students with developmental disabilities were successful at Belwin?"; "How do you define success?"; "How difficult is it to work with integrated versus segregated and nonintegrated groups at your agency?"; and "Would you like to see additional integrated programs at Belwin?"

Data analysis. All pre-, post-, and follow-up-test comparisons within groups were accomplished using a one-tailed student t-test for paired data. The alpha level for test of significance was established at  $p < .01$ . Qualitative analysis procedures included a classification of naturalists' comments into categories and the generation of major themes related to the strengths and problems associated with attempting to integrate students with developmental disabilities into environmental programs.

## Results

Quantitative analysis. Statistics describing the overall effects of integration on cognitive gains are presented in Table 1. This table also includes data representing 37 (42%) integrated nondisabled students who repeated the post-test approximately 2 months following their Belwin experience. These data indicate that there was a significant increase in scores from pre- to post-testing for the 88 nondisabled children ( $p < .01$ ), indicating significant gains in curriculum learning.

These data suggest curriculum learning gains for children without disabilities while participating in an integrated group. Data collected from the 37 re-tested nondisabled children approximately 2 months following their Belwin experience was consistent with the original pre- and post-test comparisons. Their scores indicated significant increases from the pre-test to second post-test with no significant deceleration between assessments. The overall mean scores of 6.80 (pretest), 9.43 (post-test), and 9.92 (follow-up-test) illustrate an increase in learning across this group (see Table 1).

Qualitative analysis. In the qualitative survey following the integrated study days, the five naturalists who led the programs offered generally positive responses to the 10 items on the questionnaire. Responses included such statements as: "Very positive experience. It does make for a more challenging day, however," and "I think it is a positive experience for the regular education kids." Naturalists agreed that more integrated days should be provided for the students attending Belwin. Many of the difficulties which they reported concerned meeting the needs of all children in a mixedability group, and the constraints that the structure of the research required (e.g., the standardized teaching outline), all of which made implementation of the curriculum somewhat more difficult. For example, the naturalists were sometimes challenged to make the program functional for the child with a severe developmental disability who was exhibiting inappropriate social behavior. The standardized teaching outline, which was necessary to conduct this study in a rigorous manner, was viewed by some naturalists as a constraint on their abilities to be creative and conduct the lesson acknowledging their personal teaching styles.

**Table 1.**  
**Descriptive Statistics: Effect of Integration on Achievement**

	<b>Pre-test</b>	<b>Post-test 1</b>	<b>Post-test 2</b>
<b>Integrated children</b>	<i>N</i> = 88 <i>M</i> = 6.80 range = 2-13 <i>SD</i> = 1.84	<i>N</i> = 88 <i>M</i> = 9.43* range = 3-15 <i>SD</i> = 2.90	<i>N</i> = 37 <i>M</i> = 9.92** range = 7-14 <i>SD</i> = 2.00

Note: \*significantly different from pre-test,  $p < .01$ . \*\*Not significantly different from post-test 1.

All five naturalists suggested that it was appropriate for students from special education classrooms to attend Belwin in the future. The naturalists responded that small group size was extremely important considering the specific teaching styles used at the agency. One staff member indicated that students with severe to profound disabilities should attend Belwin only on segregated days, when nondisabled children were not present. This naturalist believed that the students enjoyed themselves, but she was concerned that the students with the most severe disabilities were sometimes frustrated and overwhelmed. The other naturalists believe that it was more appropriate to integrate all of the students and were looking forward to future integration efforts at the agency. The naturalists indicated that the benefits to children with severe developmental disabilities included being outside in a more "real world" environment and having appropriate and stimulating role models (i.e., children without disabilities). The naturalists reported that the nondisabled students benefited also from the experience as they learned to be more understanding and how to deal with differences in people which could lead to a more tolerant society.

Regarding the operation of the program, the naturalists reported that although integrated days (as compared to a typical day at their agency) were more difficult to implement, they were very worthwhile. They also commented that it is their responsibility to serve all children appropriately and equally. The naturalists believed that although non-disabled children were apprehensive initially, they learned to be more accepting of the "strange" behaviors of the children with disabilities. In summary, the qualitative information revealed that although the naturalists believed that integration was more difficult to implement as compared to conducting segregated programs or nonintegrated programs, it was a worthwhile program approach that provided excellent opportunities for the children of all abilities to participate at Belwin in a rewarding and beneficial manner. This information supports the research of Rynders, Schleien, and Mustonen (1990) who assessed that outdoor educators and other camp staff found integration efforts worthwhile for all of the participants, although more

difficult to implement than a nonintegrated camping program.

## Discussion

The purpose of this study was to examine the amount of curriculum information which nondisabled children acquired while participating in a 4-hour integrated environmental/outdoor education experience. This curriculum learning was measured using a pre- and post-test on 8 days when children without disabilities were integrated with children with severe developmental disabilities. Approximately 42% of the subjects were given a follow-up post-test 2 months following their initial Belwin visit. Analysis of the pre-, post-, and follow-up-test scores revealed that children participating in the integrated groups exhibited significant increases in their scores. This finding provides support for the position that integrated environmental/outdoor education programs which incorporate the strategies of companionship training, cooperative learning, and the use of trainer advocates do not affect detrimentally the curriculum learning of nondisabled children participating in an environmental education program. This finding is also supported by the results of the follow-up post-test. These data revealed that integrated programs did not affect the retention of knowledge 2 months following their experience. Test scores of all the children participating in integrated groups either remained unchanged or increased in time. It should be noted, however, that the limitations on this portion of the study include the lack of control of information which the classroom teacher may have provided to the students in their classrooms between the two post-tests, and the limited number of re-tested students (i.e., only 42% of the students were re-tested). A second limitation was the lack of a nonintegrated (i.e., nondisabled children only) control group that would have offered us a comparison of learning gains across integrated versus nonintegrated groups.

These results are in contrast to the research of Reid, Clunies-Ross, Goacher, and Villa (1981) who suggested that a primary disadvantage of mixed-ability groups is a reduction in the achievement of the more able students. Negative attitudes among administrators, staff members, and participants without disabilities toward integration appear to be the basis for the opposition to and lack of integrated practices (Johnson & Johnson, 1986; Peterson, 1978; Schleien, Heyne, Rynders, & McAvoy, 1990). The present study may help to eliminate the negative attitudes of those who are philosophically opposed to these inclusive practices. The study results support the work of Rynders and Schleien (1991) and Schleien, McAvoy, Lais, and Rynders (in press) who contend that by structuring programs carefully and cooperatively with heterogeneous groups, integrated outdoor education, as well as other disciplines, can result in multiple benefits to all participants. Research findings by Hanline (1985) and the case studies reported by Schleien and Ray (1988) and Vandercook, York, and MacDonald (1991), in which it was found that children without disabilities made expected progress across the areas of language, cognitive, motor, perceptual, and social development when integrated with children with disabilities, are supported by the results of this study.

Many positive benefits accrued by the students were not evaluated formally, but were observed by staff members. These observations included the positive reactions from the children without disabilities, their classroom teachers, teachers and aides from the classrooms serving the children with disabilities, as well as the Belwin staff. They offered verbal thanks and expressed interest in future integrated activities. The general impression of the program participants was an overwhelming successful feeling of a job well done. The naturalists were especially pleased with the results of the tests given to the students without disabilities and the relationships they developed with their peers with disabilities.

The social integration of children with and without disabilities is a complex process that will need to be studied further so that "promising practices" can be identified and evaluated. From a staff perspective, it is evident from the questionnaire results that staff members valued the integrated program and wanted to conduct future programs in the same manner. At the same time, from a practical standpoint, they indicated that integrated programs appear to be more difficult to implement. We believe that their perceptions are accurate and reflect, possibly, the tradition of primarily segregated programming for people with disabilities in many agencies. As staff members gain more experience with integrated programming, it will probably become easier for them to design and implement these programs successfully (Rynders, Schleien, & Mustonen, 1990).

While conducting this study, several areas requiring further research were encountered. This line of research should continue to be pursued by studying similar integrated outdoor education programs of longer duration for curriculum and student evaluation, as well as with larger numbers of children with developmental disabilities. As suggested earlier, it may also prove beneficial to compare student learning across integrated, segregated, and nonintegrated groups of children. Also, the assessment of cognitive, social, and friendship gains for children who are involved in integrated programs is needed. Children with severe developmental disabilities are often slow to change. Research documenting these changes over longer periods of time could provide educators with information to develop curricular materials for future integrated programs.

Another area for future research involves a more careful examination of the integration strategies or "promising practices" that were used in this program. Companionship training has been well documented as a strategy to promote friendships in school settings, but modifications to these training curricula for shorter programs in non-school settings needs to be evaluated. Other integration strategies, such as the role of the trainer advocate and the training that he or she should receive to facilitate relationship development requires further study. Curriculum design and implementation and the training of the teacher or naturalist are other key components to a successfully integrated program (Robb, Havens, & Witman, 1983; Schleien, McAvoy, Lais, & Rynders, in press). Identifying the necessary skills that the instructor should possess, as well as how to prepare program leaders are areas in which further research could be conducted.

This study examined environmental/ outdoor education curriculum learning by children without disabilities. Social aspects of the program, such as nondisabled peers' attitudes toward the participants with disabilities, also need to be investigated as well as the attitudes of classroom teachers and naturalists. More data based research conducted in this area will improve the opportunity for children of varying abilities to be served in all outdoor education settings. We are beginning to learn a great deal about the benefits accrued by individuals with disabilities as they participate in inclusive settings alongside their nondisabled peers. However, P.L. 94-142 and its amendments, such as P.L. 101-476, the Individuals with Disabilities Education Act, as well as P.L. 101-336, the Americans with Disabilities Act, clearly specify that programming in the least restrictive environment should be achieved without sacrificing equity and excellence in services to nondisabled participants. Previous studies by these researchers indicate that the nondisabled community is not adversely affected by integrated programming, and in fact, benefit substantially, as well. Inclusive outdoor education and recreation programs will have a positive impact on children with and without disabilities, regular and special program staff, administrators, and families (McAvoy & Schleien, 1988; Schleien, McAvoy, Lais, & Rynders, in press).

Integration works for everyone's benefit. It is now the task of researchers and practitioners alike to address more empirically the many questions concerning the multiple impacts of inclusion on people with differing abilities.

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