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ABSTRACT

Collaboratives are increasingly common forms of community participation in education. This article describes the Children Learning About Self and Science (CLASS) Program, a collaborative aimed at introducing and attracting children to science and scientific careers in the Cleveland School District. This project originated in the community and brought a wide array of resources to the schools involved. The outcomes of the program are discussed, including teacher reactions to the program. Four lessons were drawn from the work of the collaborative: (a) management of a collaborative needs to be flexible to meet changing demands on members, (b) providing access to community resources enhances teaching and learning in schools, (c) participation of the principal and key teachers is vital to the success of community-based initiatives, and (d) monitoring program process and outcomes provides valuable guides for action. It was concluded that the CLASS program is an example of a community-based initiative showing how a number of institutions coalesced around overlapping goals, were sensitive to the schools' needs, relied on successful staff development models, and built structures and activities to enhance science teaching. (JRH)

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Occasional Paper #16

# Enhancing Science Education in the Primary Grades Through a Community-Based Collaborative: Lessons From the CLASS (Children Learning About Science and Self) Program

by

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Collaboratives are increasingly common forms of community participation in education. This article identifies keys to a successful collaborative aimed at introducing and attracting children to science and scientific careers in the Cleveland School District. Four lessons are drawn from the work of the collaborative: (a) management of a collaborative has to be flexible to meet changing demands on members, (b) providing access to community resources enhances teaching and learning in the schools, (c) participation of the principal and key teachers is vital to the success of community-based initiatives, (d) monitoring program process and outcomes provides valuable guides for action.

In the last few years, increased awareness of overlapping goals and the benefits that can result from joint work has led to the formation of many collaboratives by community organizations, agencies, and institutions. In Cleveland, a number of institutions— the Cleveland Children's Museum; the Cleveland Education Fund; the Institute for Environmental Education; the Shaker Lakes Regional Nature Center; the Great Lakes Museum of Science, Environment, and Technology; and the North East Ohio College of Medicine— whose success depends on a scientifically aware and informed public, formed a collaborative to develop the CLASS (Children Learning About Science and Self) Program. The goal chosen for CLASS—to introduce and attract children to science and scientific careers— was valued by all the members.

Awareness of low scientific literacy and curiosity among large sectors of the urban population and below average performance by urban students in science preoccupied the members of the collaborative. Each member was intent on addressing issues of equity by developing stronger links with the community and with the schools. The Cleveland Children's Museum, for one, was working to involve the community in the museum and engage in ongoing collaboration with organizations that contribute to expand and enrich the museum's public (Fox, 1993; Hein, 1993). Both the Cleveland Children's Museum and the Shaker Lakes Nature Center were interested in being able to draw visitors from a public responsive to hands-on and minds-on learning. The university partners, in turn, wished to enhance their role in enlarging and diversifying the pool of those motivated and prepared to pursue scientific careers.

CLASS is an example of a new breed of project that originates in the community and

brings a wide array of resources to the schools. In 1992, with funding from the Hughes Medical Institute, the partners began a teacher training and support program to enhance the newly adopted primary science curriculum in the Cleveland Public Schools. The final expected outcome was that children would learn more science and become aware of their everyday surroundings as a laboratory; the intermediate outcome was to increase teachers' knowledge of and delight in science.

## The Program

CLASS has two teacher training stages: (1) a four-week set of intensive summer workshops and (2) outreach support. In the summer workshops, the teachers explore science, evaluate their schools as science classrooms, and develop hands-on, discovery-learning activities. Renowned local area college professors and educators teach the summer workshops. During the school year, the resource team assists teachers both inside and outside the classroom, and an informal network supports teachers in their innovative efforts. In addition, the teachers who participate in the summer training conduct workshops for other teachers in their building.

Two outreach components and two summer components have been implemented so far. Twenty-four teachers have completed the summer workshops. Thirty workshops were provided by these teachers in their own buildings during the first year of outreach. One hundred and seventy six teachers participated in school-based and community-based workshops offered by CLASS during the school year. Teachers used those opportunities to learn and network with their peers. In addition, the CLASS Project Educator trained teachers to use the physics machine, which was placed in 28 schools for classroom teachers who completed training in the physics modules.

From the beginning, the CLASS staff worked at the process of collaboration with the Cleveland schools. They selected a curriculum to enhance the new science curriculum for the city's primary schools consisting of three strands: physical, earth/space, and life sciences. Since Cleveland schools have site-based management, additional research at the school level was required. The CLASS staff visited the 59 targeted schools to find out what they were doing in science, how they were doing it, and which was the best way for CLASS to enhance their science teaching. The Cleveland School District had designated a lead science teacher at each school who

worked with a science committee to spearhead the implementation. The CLASS staff met with principals and lead science teachers in each building to find what was being taught and what kind of support the lead teacher was getting from the science committee.

Based on their work at the schools and with the teacher advisory board, topics for the summer and school-year workshops and the curricular extension units were chosen. They settled on environment/habitat, herpetology, geology, and astronomy units for the summer workshops and weather, habitat, water, and astronomy units for the school year. In addition, because they found that the most extensively used module dealt with lifting heavy things, they designed and developed a physics machine to extend the teaching of those units.

The way the CLASS Program curriculum was delivered was as important in affecting science teaching as the topics that were taught. Teachers learned new concepts and gained appreciation for the world around them as a science lab; they became excited about the process of doing science. Teachers had the opportunity to share ideas among themselves and participate in team projects developing activities for the classroom. During the second summer, three graduates of the previous summer acted as instructors' assistants, discussing with teachers how they had implemented some of the activities in their classrooms and answering questions teachers raised.

The CLASS Program has been more successful than most science staff development programs in transferring what teachers learned into class activities. To a large extent, this success is due to the way CLASS has combined features of staff development that proved successful in other programs (O'Brien, 1992).

First, the program created mechanisms to support innovative science teaching in each of the buildings it targeted. Each of the CLASS participants taught in-service workshops in their building thus becoming the node of a supportive network for teachers trying out new activities. All the CLASS participants reported high ratings for their workshops but, more importantly, many of the in-service teachers actually implemented the activities in their classrooms. Ongoing staff development sustained innovative teaching. The CLASS Program confirms the notion that staff development cannot be a one-time event, that teachers need support as they go back to the classroom and begin to implement what they learned (O'Brien, 1992). A community collaborative offers teachers support from many individuals. For instance, the astronomy instructor was

actively involved in providing advice, suggestions, and support for science activities on the day of the solar eclipse, and the herpetology instructor supported a lending program where teachers could borrow a reptile or amphibian for a short time with instruction from the herpetologist about the animal and daily care tasks. This project brought a new resource, the Northern Ohio Herpetologists' Association, to the collaborative.

Second, as discussed above, the curriculum has been tailored to the science curriculum in the schools. In addition, a teacher advisory board was formed. During the first year of the project, teachers participated in monthly workshops to provide information about classroom teachers and resources. During the second year, the advisory board continued to meet to review curriculum unit plans, hands-on classroom science activities and to share information about resource persons and materials.

Third, teachers have acquired knowledge and changed their attitude toward teaching science. "I learned a great deal," "I was able to use a lot of different ideas I learned," "It rejuvenated my teaching," "It made teaching fun," were some of the ways teachers described how participating in the CLASS Program had affected their teaching.

Fourth, teachers became aware of resources and people they could access. "I wrote a small grant," said one teacher, while another recounted how she had contacted a summer instructor for assistance in developing a classroom activity.

Fifth, teachers felt more willing to try new activities. "I have done more science things in the classroom," "I used a lot of different ideas," "I felt more comfortable teaching science," were some of the comments made by teachers.

Sixth, teachers were not only introducing more science activities, they were deliberately connecting science to art, language arts and other subject matter in the curriculum. To illustrate, students were writing essays about the classroom animal and creative stories about asteroids; keeping weather journals; and collaborating in painting murals depicting dinosaurs.

The final expected outcome for the CLASS Program—making children aware of everyday surroundings as a science lab and curious to ask questions—was taking place, according to teachers. "The kids are beginning to see science all around them" observed one teacher, while another one remarked "They are beginning to connect with other subjects by themselves."

## The Lessons

Schools and community-based collaboratives can learn several lessons by examining the process by which CLASS achieved desired outcomes.

1. *Management of a collaborative has to be flexible and sensitive to meet changing demands on members.* Building and maintaining a collaborative takes a lot of work and is frustrating at times. CLASS began as a collaborative of equals, with well-defined roles for each partner. As time went by, accommodations had to be made for unexpected developments, changing the level of involvement of some of the partners. A few partners became very active, others remained in the background, and new partners were brought on board (the Cleveland Nature Science Museum, Case Western Reserve University, and the Urban Child Research Center at Cleveland State University). The Cleveland Children's Museum took the leadership role in structuring opportunities for different levels of commitment. In a collaborative venture, partners have to be flexible and recognize that participation will fluctuate with time, as changing external circumstances and internal developments affect members.

2. *Providing access to community resources enhances teaching and learning in the schools.* Museums, science resource centers, and universities can provide much needed assistance in preparing teachers to identify and create discovery-based activities for their elementary schools. The expertise of the college professor, the activities suggested by a nature center guide, and the field trips of a natural museum specialist give teachers different ways of seeing and teaching science. "I learned much more in this program than I would if I had taken a college course in science," one teacher said. Indeed, the resources that the collaborative brought to these teachers helped them realize how they could teach science and helped when they were ready to implement activities in the classroom.

3. *Participation of principals and key teachers is vital to the success of community-based initiatives.* The staff of the CLASS Program took a number of steps to include principals and key teachers. They visited each school to tailor the curriculum to what was being taught, developed a teacher advisory board, provided services that teachers found useful, and introduced changes to adapt the program to the workings of schools. Teachers were not merely clients receiving a service, the program was built on the assets, both individual and organizational, that teachers and



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other community members were able to mobilize for the collaborative (McKnight & Kretzmann, 1990).

4. *Monitoring program process and outcomes provides valuable guides for action.* Midcourse corrections in the CLASS Program were introduced as a result of the ongoing evaluation of the program conducted by the Urban Child Research Center. For example, graduates of the first summer workshops were hired as instructors' assistants to respond to teachers questions about how things had worked out when trying to implement some of the ideas they were learning. The instructors' aides were reassuring to teachers because they could tell them that discovery-based science could be taught in schools and classrooms like theirs, describe how it had been done, and identify some of the obstacles they had faced, all from a perspective teachers could relate to. Another benefit of ongoing evaluation is that time was scheduled to complete more collaborative projects during the second summer, after we learned that it was very difficult for teachers in different buildings to schedule collaboration times.

## Conclusion

Community-based collaboratives are knocking at the schools' doors with valuable resources to enhance education. Traditionally, schools have played a client's role, receiving services planned and developed without their input. As part of the larger community redevelopment trend, this is changing and schools are now vital partners of community-based initiatives. The CLASS Program is an example showing how a number of institutions coalesced around overlapping goals, were sensitive to the schools' needs, relied on successful staff development models, and built structures and activities to enhance science teaching. Each one of these institutions understood that it was part of the larger community and that to meet its goals it had to find new ways of bringing their resources to the schools.

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