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AUTHOR Berlin, Donna F.; White, Arthur L.
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INSTITUTION National Center for Science Teaching and Learning, Columbus, OH.
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ABSTRACT

The model presented in this document focuses on an action research project known as the Academic Challenge Program (ACP). The program is designed to facilitate the collaborative, systematic development of research-based, innovative educational practice and to bridge the gap between educational theory, research, and classroom practice. General goals of the program are to promote collaboration between institutions of higher learning and state educational systems including practitioners and administrators; and to provide leadership in the following areas: identification of educational needs and problems; new knowledge about teaching and learning; the translation of new knowledge into classroom practice; the evaluation of new practices; and the dissemination of research findings and instructional materials. Specific objectives of the program are: to provide teachers with knowledge and experiences related to innovative teaching methods and materials, as well as the knowledge and experience needed to conduct classroom-based research; and to develop, implement, evaluate, and disseminate innovative teaching methods and materials. The ACP consists of three interrelated phases: pedagogical awareness; research, development, and evaluation; and classroom application. The report concludes with a discussion of the relationship between components of the ACP and the academic year. (LL)

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Teachers as Researchers:

Implementation and Evaluation of an Action Research Model

By Donna F. Berlin and Arthur L. White

Among the issues identified by recent education reform documents is the lack of communication between educational researchers and educational practitioners or bridging the gap between research and practice. Current literature supports action research as a method for expanding the base of educational research and educational knowledge—one which seems to have much promise in the current era of reform in education. Specific to science education, White and Tisher (1986) reflect that while a great deal of science education research has been conducted over the last decade, very little has affected practice. One of their suggestions to meet this challenge is for ". . . teachers to become full members of the [research] teams. This development may lead to a different, collaborative style wherein research is done by and with, rather than, on the teacher" (p. 897). Similarly, Shymansky and Kyle, Jr. (1991, March) in their document *Establishing a Research Agenda: The Critical Issues of Science Curriculum Reform* provide a strong rationale for use of collaborative action research in science education research:

> *Our understanding of science teaching and learning will be enhanced by practitioners and researchers theorizing, planning, conducting, and interpreting research that is pedagogically valid. Enhanced communication and collaboration should inform the process and influence practice (p. 40).*

Ebbutt (1985) defines action research as ". . . the systematic study of attempts to change and improve educational practice by groups of participants by means of their own practical actions and by means of their own reflection upon the effects of those actions" (p. 156). According to McKernan (1988), "the purpose of action research is to solve pressing day-to-day practical problems and to increase our understanding of problems. It is on-the-site inquiry aimed at problem resolution" (p. 154). Ross (1984, Winter) states that action research can "help us view research as integrated with practice rather than as a process which is conducted separately and then implemented in classrooms" (p. 114).

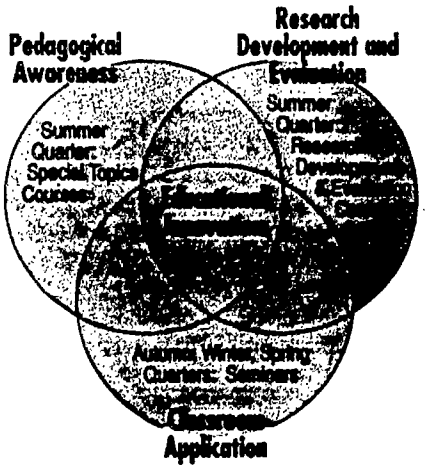

Figure 1: The Three Phases of the Academic Challenge Program (ACP)

The following model for action research along with its evaluation has been funded by a State of Ohio Board of Regents Academic Challenge Program grant and by Focus Area 5 of the National Center for Science Teaching and Learning. The model has been implemented for five years at The Ohio State University at Newark (OSUN) and one year in the South Western School District in Grove City, Ohio. The focus of this model, known as the Academic Challenge Program (ACP), is action research designed to facilitate the collaborative, systematic development of research-based, innovative educational practices. The program is designed to bridge the gap between educational theory, research, and classroom practice.

The general goals of the program are to:

- promote collaboration between institutions of higher learning and state educational systems including practitioners and administrators;
- provide leadership in the identification of educational needs and problems;
- provide leadership in the identification of new knowledge about teaching and learning;
- provide leadership in the translation of new knowledge into classroom practice;
- provide leadership in the evaluation of new classroom practices; and
- provide leadership in the dissemination of research findings and instructional materials.

The specific objectives of the program are to:

- provide teachers with knowledge and experiences related to innovative teaching methods and materials;
- provide teachers with knowledge and experiences in order to conduct classroom-based research; and
- develop, implement, evaluate, and disseminate innovative teaching methods and materials.

The Academic Challenge Program consists of three interrelated phases: Pedagogical Awareness; Research, Development, and Evaluation; and Classroom Application. Figure 1 illustrates the relationship between components of the ACP and the academic year.

The "Pedagogical Awareness Phase" consists of one or two special topics courses. Each summer these special topics courses are selected based upon expressed needs of the educational community, current topics of interest, national and state concerns, and the state requirements for teacher education certification.

In addition, a "Research, Development, and Evaluation (R D & E)" course is taught every Summer Quarter. This course, Action Research: Solving Educational Problems in the Classroom, prepares the students in the fundamentals of inquiry in education. It includes literature search strategies and basic concepts and principles of research design, sampling, measurement, statistical inference, data analysis, and interpretation related to both quantitative and qualitative paradigms.

During the academic year (Autumn, Winter, Spring Quarters), three seminars are provided to facilitate and support the translation of the "Pedagogical Awareness" and "Research, Development, and Evaluation" experiences of the summer into Classroom Applications including exploration (piloting), development, implementation, and evaluation activities. These seminars are designed to provide ongoing review and support for the classroom-based research and continuous feedback for program modification. The seminar foci are: Autumn Quarter—development of innovative teaching materials and evaluation instruments, Winter Quarter—implementation of the innovative projects in the classroom and collection of pre- and posttest data, and Spring Quarter—data analysis, report writing, and oral presentation.

As a culmination to the program and as a dissemination mechanism, at the end of the Spring Quarter a two-day conference is held at a State Park Lodge. The conference brings together the teachers and other professional educators to share their innovative ideas and research studies in order to facilitate professional development and improve education. The purpose of this conference is to share experiences, innovative instructional materials and activities, research findings, and reflectively evaluate the Academic Challenge Program. Each report published in the Conference Proceedings consists of two parts: a description of the innovative activity developed and implemented by the classroom teacher and a report of the research results related to the evaluation of the innovation. These Proceedings are distributed to all conference participants.

For the first year of the ACP (1988–1989) only one special topics course entitled "Integrating Technology into the Classroom" along with the Research, Development, and Evaluation course was scheduled during the Summer Quarter. During the academic year (Autumn, Winter, Spring Quarters), the Classroom Application (Development, Implementation, and Evaluation) seminars were scheduled.

The innovative activities developed, implemented, and evaluated through action research projects during the 1988–1989 ACP involved art, mathematics, reading, science, social studies, and writing and were implemented in classrooms which included kindergarten through eighth grade students, learning disabled students, and preservice elementary school teachers. The common thread among all the innovations was the deliberate integration of technology into the teaching and learning process. The types of technology that were used included the calculator, computer, overhead projector, and videotape camera and player.

Pretest data reflecting the classroom teachers' attitudes and perceptions related to educational technology and educational research were collected during the program orientation meeting. In addition, the teachers were given log books in which to record their perceptions, thoughts, reactions, and noteworthy events related to the courses, their action research, and the program. These data along with other measures were collected and compared to data collected at the culmination of the program.

Two 20-item semantic differential instruments were created, tested, and revised resulting in two 15-item instruments to measure the attitudes and perceptions of teachers related to Educational Technology and Educational Research. The participants responded to these instruments in June, 1988 before the first class; at the end of the program in June, 1989; and approximately seven months after they had finished their formal participation in the program (February, 1990).

Data analysis indicated that the attitude and perception mean scores increased substantially from Pretest to Posttest and continued to show an upward trend in the Follow-up responses. This change was revealed for both Educational Technology and Educational Research. Comparisons of the Pretest, Posttest, and Follow-up means for each of the attitude/perception scales indicated that the Pretest means for both the Educational Technology

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and the Educational Research scales were significantly different from their respective Posttest and Follow-up scale means. In summary, the quantitative data analysis indicates that based upon the attitude/perception scales the participants made significant growth toward the ideal as perceived by the program staff. This growth appeared to continue to move upward over time.

Accounts of the 1988–1989 OSUN Academic Challenge Program have appeared in various city and county newspapers and in publications of The Ohio State University. Information has been distributed at department, university, and college meetings and at various professional education conferences. Teacher participants have presented their innovative teaching materials and their research findings at the various state level professional education conferences. In addition, two of the ACP teachers have published their innovative activities in the refereed journal *School Science and Mathematics*. Follow-up data indicate that several of the ACP teachers have assumed leadership roles in their district and have made presentations at inservice meetings, board of education meetings, and professional education conferences. Of note, many of the participants have been accepted into or are near completion of their Master's Program.

As a result of the OSUN Academic Challenge Program the quality of communication and collaboration between university teacher educators and classroom teachers has been improved and a cadre of teachers has been identified that can provide leadership in education research and the development, implementation, and evaluation of effective innovative teaching materials and methods as well as provide exemplary classrooms as field sites for preservice education students. Implementation of the ACP at other sites and the analysis of data related to the ACP during 1989–1990, 1990–1991, and 1991–1992 are in progress with support from Focus Area 5 of the National Center for Science Teaching and Learning.

It is our belief that the key to the success of action research lies in the empowerment of classroom teachers and genuine collaboration among classroom and university educators. This collaboration is characterized by mutual respect; encouragement; support; continuous, open communication; and unfailing good humor. The ultimate goal is not to translate research into practice, but rather to move research into practice.

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