History and Foundations

Curriculum Research & Development Group

University Laboratory School

WELCOME

On behalf of the Curriculum Research & Development Group (CRDG) in the College of Education at the University of Hawai‘i at Mānoa and the University Laboratory School (ULS), we welcome you to the CRDG/ULS family. We have created this packet of readings to help orient you to the history and foundational ideas that guide our work.

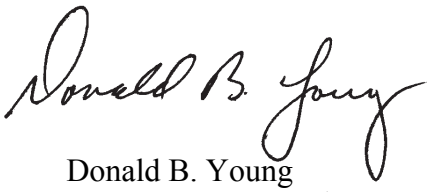
While the roots of CRDG and ULS go back more than a hundred years, the research partnership in its current form dates to 1966 when CRDG's founding director, Arthur R. King, Jr., was given the charge of creating a center for curriculum research and development by College of Education Dean Hubert Everly. This was the beginning of the research partnership that has allowed CRDG and ULS to influence change in curriculum, instruction, assessment, and school systems by creating programs and practices that result in improved student learning. These readings provide an overview of the philosophy and foundational theories that guide our work and of the evolution of the organizations and the work we have done.

CRDG assembles teams of academic scholars, teachers, design specialists, evaluators, and others to create instructional programs and professional development services that improve learning, teaching, and assessment. CRDG's work is focused on five interrelated fields of educational endeavor, each of which addresses a central issue facing education in Hawai‘i, on the US mainland, in American overseas schools, and in other nations.

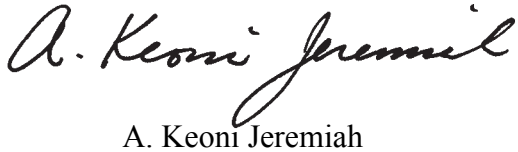
- Science, Technology, Engineering, and Mathematics (STEM) Education
- Hawai‘i, Asia, and the Pacific
- Serving Diverse Learners
- Educational Technology Development
- Designing Educational Systems

Since 1966, ULS has served two interlocking missions: to design and deliver the best possible education to its students, and to serve the educational research and development community through its role as a research laboratory. The student population is randomly selected from among applicants to represent a broad cross section reflecting distribution in the state's population of gender, academic achievement, family income, and ethnicity. All students take a challenging comprehensive curriculum that includes English, mathematics, science, social studies, art, music, performing arts, and foreign languages in non-segregated classes and graduate ready for college, work, and responsible citizenship.

We are pleased you have accepted our invitation to join the CRDG/ULS family and wish you all the best as you join us in this important work.



Donald B. Young
Director, CRDG



A. Keoni Jeremiah
Principal, ULS

CRDG/ULS: Our Roots

1895 A teacher training department is formed at Honolulu High School, located in Princess Ruth's former mansion (now Central Intermediate School).

1896 The teacher training department moves to Victoria and Young Streets and is renamed Honolulu Normal and Training School.

1905 After annexation, Hawai'i becomes a US territory. Honolulu Normal and Training School is renamed Territorial Normal and Training School and is moved to Lunalilo and Quarry streets.

1930 Benjamin Wist (later dean of Teachers College) becomes the principal of the school.

1921 The school moves to a new 15-acre site (once a pig farm) adjoining the University of Hawai'i at Mānoa. The university's Department of Secondary Education becomes the School of Education.

1931 The legislature transfers the Territorial Normal and Training School to the School of Education. The School of Education is renamed Teachers College.

1939–1941 An elementary school (University Elementary School) is built on Metcalf Street as part of Teachers College. Construction begins on Castle Memorial Hall, a training center for kindergarten and nursery school teachers.

1941–1945 Punahou School, displaced by the military occupying its campus, moves into Castle Memorial Hall and other buildings, but Teachers College continues to operate.

1943 University High School Building 1 on the Metcalf Street side of Teachers College is completed as an intermediate school.

1948 University High School Building 2 is constructed adjacent to Building 1. The schools now offer a complete K–12 curriculum. Hubert Everly (later dean of the College of Education) becomes the principal.

1959 Teachers College becomes the College of Education, and Hawai'i becomes the fiftieth state.

1966 The schools become part of a new entity, the Hawai'i Curriculum Center. This is a joint operation of the Hawai'i Department of Education and the University of Hawai'i to develop curriculum programs and materials for schools.

1969 The Hawai'i Curriculum Center is phased out and the University Laboratory School (ULS) comes under a new College of Education unit known as the Curriculum Research & Development Group (CRDG).

1996 CRDG, along with other research units, reorganizes under the UH Office of the Senior Vice President for Research.

2000 CRDG merges with the College of Education. ULS applies for charter school status.

2001 ULS becomes a charter school and continues to serve as a laboratory for curriculum R & D in partnership with CRDG.

Annotated Bibliography of Required Readings for CRDG and ULS Faculty and Staff

King, Arthur R., Jr. (Fall 2000). The Shaping of the Curriculum Research & Development Group and Its Laboratory School: A Response to the Events of the 1960s. *Educational Perspectives 33* (2), 19–24.

> This is a comprehensive description of CRDG's first thirty-four years including a brief overview of the theoretical foundations as described in King and Brownell.

King, Arthur R., Jr. (Oct. 1967). The Modern Educational Developer: Member of the World's Youngest Profession. *Educational Perspectives 6* (2), 11–13, 32.

> King's article from a 1967 issue of *Educational Perspectives* describes the new profession of curriculum design and development. An overview of the entire issue by King is also included in the handout.

Hinze, Richard H., King, Arthur R., Jr., Krause, D. Loretta, & Nunes, Shiho S. (May 1977). Ten Years of Curriculum Research and Development in Hawaii: Where Have We Been? *Educational Perspectives 16* (2), 3–5.

King, Arthur R., Jr. (May 1977). Curriculum Theory and Educational Change Processes: Comments on the Role of Curriculum Theory in the Hawaii Curriculum Research and Development Group. *Educational Perspectives 16* (2), 6–8.

> These two articles from a 1977 issue of *Educational Perspectives* provide an overview of CRDG after ten years. The first is a retrospective that demonstrates in its authorship the characteristic team approach to work at CRDG. The second, by King, revisits the foundational theory and describes how it has developed in practice.

King, Arthur R., Jr. (January 1987). Challenge to Laboratory Schools: Finding a Niche. *Eminent Educator Lecture Series 1*. Buffalo, NY: National Association of Laboratory Schools

> Part of the National Association of Laboratory Schools *Eminent Educator Lecture Series*, this lecture by King provides an overview of the roles and potential of laboratory schools.

National Association of Laboratory Schools. (1991). *Laboratory Schools: An Educational Resource*. Indiana, PA: Author.

> Acknowledgments and Foreword, pp. vii–xi
> excerpt from Chapter 3, Strategic Planning for Laboratory Schools: Concepts, Models, and Cases, pp. 35–37 and 68–77
>
> Two selections from this book—"the orange book"—are included in this set of readings, although the entire book is an excellent resource for those interested in the history and role of laboratory schools in general. These excerpts provide some

general background on laboratory schools as well as a brief description by King of the work of our school as a center for developmental research.

Boynton, Nicole T. (June 2003). Deep Impact: Measure Up Math. *Venture 10*, 61–66.

Nakaso, Pam. (Spring/Summer 1994). Perfecting School Curriculum. *Malamalama 18* (3), 10–13.

Morehouse, Lisa. (2007). How to Get Students to Use New Skills. Published online in *Edutopia: What Works in Education*, http://www.edutopia.org/how-to-students-as-practitioners

These three pieces are more recent examples of features about CRDG and University Laboratory School work in popular media.

The Education Laboratory: A New Century Public Charter School, Detailed Implementation Plan

This document, known as the DIP, is provided separately. It describes the philosophy, programs, and organization of University Laboratory School and the relationship between the school and CRDG. It is the basis upon which the state charter was granted and the conditions under which the school operates.

The following additional readings are available for those who want more information:

King, Arthur R. Jr., & Brownell, John A. (1966). *The Curriculum and the Disciplines of Knowledge: A Theory of Curriculum Practice.* New York: John Wiley & Sons.

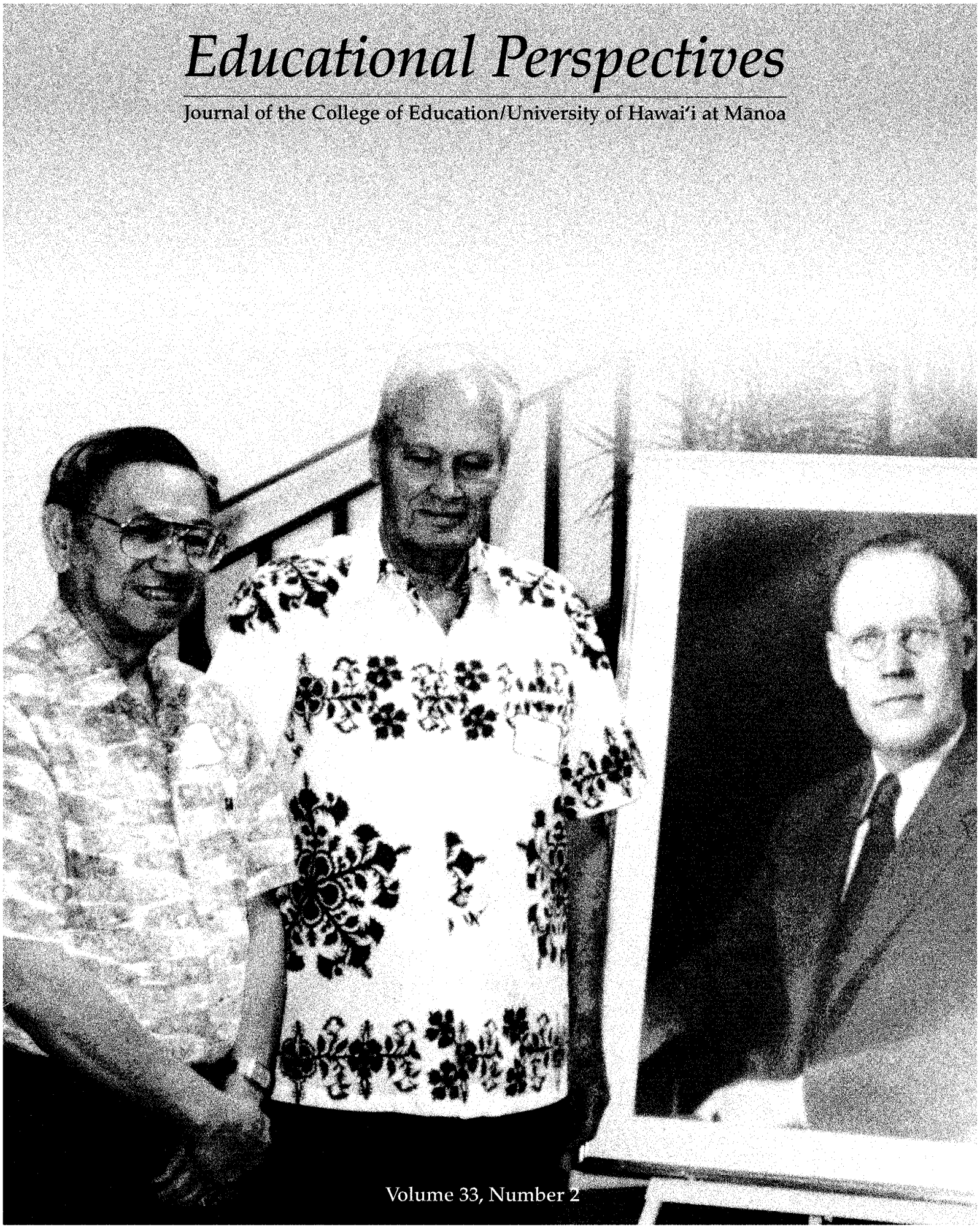
If you're hooked at this point and want to know everything there is to know about the foundational curriculum theory behind the work of CRDG and the University Laboratory School, this is your next stop! Although the book is now out of print, there are numerous copies available within CRDG and ULS. Just ask.

From 2003 on, our work has been documented in annual *Year in Review* publications.

These annual reports highlight the research work of CRDG, feature educational activities and research conducted at ULS, and show, through descriptions of our work, how the partnership between the two works in practice. All issues of *Year in Review* are available online at the CRDG website (www.hawaii.edu/crdg).

Educational Perspectives

Journal of the College of Education/University of Hawai'i at Mānoa



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Cover Photograph: (l-r) Andrew In, Hubert Everly and a photograph of Benjamin Wist.

The College of Education in the Sixties
Volume 33 ■ Number 2, Fall 2000

The Shaping of the Curriculum Research & Development Group and Its Laboratory School: A Response to Events of the 1960s

Arthur R King Jr

The formation and continuing evolution of the Curriculum Research & Development Group (CRDG) and its University Laboratory School are part of Hubert Everly's legacy as dean of the College of Education. Built from three laboratory schools—preschool, elementary, and secondary—founded variously from 1890 to 1948, the CRDG now exists in a form that emerged during the mid 1960s. The unit would not exist in its present form, or even exist at all, without Hu Everly's vision, guidance, and political skill.

What happened, why, and how? And what did we learn during the Everly era? To answer these questions is my challenge in this article.

What Do the CRDG and Its Laboratory School Do?

Today the CRDG, with its laboratory school, is known as one of the nation's major centers for curriculum research, development, and assistance to schools. From its roots in Hawai'i, the unit's influence has expanded across the nation and beyond, with more than 600,000 students being schooled in CRDG-developed programs. Several foreign countries have translated and adapted CRDG's curricula for use in their own schools.

The CRDG improves educational practice by expanding the ideas and the number and quality of tools that teachers and students use. The CRDG has developed, evaluated, and disseminated over 600 educational tools in its thirty-four-year history. These tools comprise published books, multimedia materials, and educational practices intended to draw children and youths into reflection, inquiry, thinking, and solving problems. They also include materials and professional development activities that help teachers communicate the nature, potential, and strategies of the curricula, plus materials for parents and school administrators. At present, some twenty projects are either on the drawing board or under revision. Many tasks await the energy and the funds to complete them. Over the years, the CRDG has made excursions into new educational technologies, with new initiatives being explored and developed.

Forces for Change: The Educational Environment of the 1960s

The Curriculum Research & Development Group and the laboratory school of the University of Hawai'i, in their current forms, emerged from conditions and events during the 1960s that stimulated a reshaping of educational institutions in Hawai'i and in the nation at large. The time was ripe for a paradigm shift.

By the standards of the time, the nation was prospering. Veterans of World War II were emerging as leaders in their communities; their children were attending the nation's schools. The United States was working out its role as a world leader. And President Johnson's "Great Society" initiatives expressed a new national purpose embedded in a program of action. This program launched large and long-enduring enterprises in education, along with unprecedented funding for reform and research. Much of the money had been flowing into universities for developing curricula and instructional materials for elementary and secondary schools. Among examples of such programs were the School Mathematics Study Group (SMSG), the Biological Sciences Curriculum Study (BSCS), and the Physical Science Study Committee (PSSC). The nation's major scientific organizations, such as the National Academy of Sciences and the American Association for the Advancement of Science, were leading the advance. The Carnegie Corporation and the U S Department of Education also participated. (Jerome Bruner's important little book, *The Process of Education* [1960], is an insightful introduction to this exciting work.)

Hawai'i too was demanding educational reform and new programs to upgrade schooling. The Democratic Party had assumed control of both the legislature and the governorship. Their message of creating quality schools as the avenue to social betterment and upward mobility was political magic, especially to military veterans and organized labor.

These sentiments were expressed powerfully by David Thompson in an article entitled "ILWU and Decision-Making in Education," published in the December 1966 issue of *Educational Perspectives*. Thompson, the education director of Hawai'i Local 142 of the International Longshoremen's and Warehousemen's Union, reported a 1962 policy statement of the union, which represented 22,000 members in Hawai'i's

sugar, pineapple, longshore, hotel, and other industries on all islands (p 14). Thompson presented a clear view of the labor movement's educational goals for its members and their children—a view held also by the Democratic Party of the time.

> We live in a democracy. Every child must have an education, which gives him the power to share in policy making, and the wisdom to shape a good life. He must have the liberal academic education which is traditional for rulers: instruction in reading, writing, speech, literature, history, government, logic, mathematics, natural science and fine arts. (p 14)

Thompson remarked further that "a sound preparation in the academic disciplines is now the best preparation for work" (p 15).

Federal money to improve education and other social programs was coming into Hawai'i in phenomenal amounts. Through its control over appropriations, the Hawai'i legislature took direct action on education, debating many school issues and programs in the halls of 'Iolani Palace.

Public education was on the move. The first elected school board was taking control of the state's Department of Education. The statewide university system was emerging, and the Mānoa campus was taking shape as a major research university on the U S land grant model.

The College of Education was also responding to the demands of the times, adding new faculty, many with research credentials. Faculty members were creating and implementing a number of experimental programs of teacher education, such as the Ford Program and the Honolulu Project, and revamping existing ones. They were also becoming involved in some international contracts. On the research side, the College of Education, with support from the university administration and the state's legislature, formed the Educational Research and Development Center (EDRAD).

The three laboratory schools and their staffs, with their limited resources (most staff were at the instructor level, fully occupied with their regular duties of teaching and teacher training), were also redirecting their efforts toward research. By 1965, the schools' faculty had made nineteen contributions to research and program innovation, dealing with such topics as individualized instruction in high school English, independent study in the teaching of spelling, radio astronomy, behavior rating scales, the Montessori program, the Initial Teaching Alphabet program, creativity development, Japanese language, programmed learning, audiovisual aids, educational television lessons, and remedial reading. High school teachers/supervisors were experimenting with the new curricula in math and science developed by the major national curriculum projects noted above.

The vision of a new role for the college's three laboratory schools was evolving in the early 1960s. Dean Everly, the former principal of the high school and a longtime student of lab schools, took the lead. He commissioned David Ryans, the director of EDRAD, to solicit the views of leading researchers on the potential of laboratory schools as centers for educational research.

The laboratory schools had become a subject of concern in American universities, including the University of Hawai'i. Many major universities were closing down their laboratory schools. Why?

In the early twentieth century, laboratory schools were considered an indispensable part of teachers colleges and of schools and colleges of education in universities. But conditions changed. The demand for teachers was outstripping the capacity of campus laboratory schools to accommodate them, so most clinical practice was accomplished in regular schools. The quality of American schools had improved substantially over the years, so that regular schools could supply mentor teachers and quality programs. Furthermore, as teacher education became more integrated into the growing universities, schools of education had to compete for funds with arts and sciences and other programs, and laboratory schools often lost in the competition. .

But Everly was committed to preserving Hawai'i's laboratory schools. He believed, along with many others, that changing the schools' function from teacher training to research and development was a good strategy. A major study of the College of Education in 1966 produced a report titled "Preparation of Teachers and Other Educational Personnel in Hawaii," later known informally as the Stiles Report, reflecting the role of the study's director, Lindley Stiles, dean of the School of Education at the University of Wisconsin. Stiles was the leader among a group of college deans from major universities who were lobbying Congress for funds to support educational research. The report carried a section with the title "Role and Function of the Laboratory Schools." In it, Stiles offered an appealing combination of educational and economic reasons to justify reorganizing the laboratory schools as a curriculum research center.

> The cost of operating the Laboratory Schools as facilities for research and school improvement should be looked upon by the University and the people of the State as a basic "seed corn" investment to attract outside support for education research and improvement operations. . . . Programs of research and innovation now being planned by the faculties of the Laboratory Schools are directly related to the objectives of a number of federal programs from which research grants may be forthcoming. All kinds of research, both basic and applied, have the potentiality of being supported. . . It [federal money] would also support a proposal for a research and

development center. Discussions under way that may ultimately link the Laboratory Schools' research facilities with the plans being made by the State Department of Education to provide a supplementary service center to the State might well make these schools eligible to utilize funds from Title III of the Elementary and Secondary Education Act of 1965 (pp 66–68).

Stiles further argued that laboratory schools could be ideal facilities for "keeping teachers abreast of latest educational improvements." He also noted that certain educational problems in Hawai'i are "unique to its own cultural traditions; hence, research is needed in the local setting if workable solutions are to be achieved" (p 69).

Stiles's arguments helped convince legislators and university administrators, if they were not already convinced, that the lab schools should be transformed into facilities for research and development to improve schooling. The prospect that such an enterprise could attract money from the federal government, philanthropic foundations, business and industry, and state governments was especially seductive. "Thus, new opportunities and new sources of support for educational research are becoming open just when the Laboratory Schools are changing their role and function to take advantage of them" (p 69).

My Participation

My own participation in the CRDG story began in 1965. I was acquainted with education in Hawai'i, having taught at Punahou School from 1946 to 1949 while studying at the College of Education evenings and summers.

In 1965 I was an associate professor at the Claremont Graduate School in California, specializing in teacher education and curriculum studies. David Ryans, director of the new Educational Research and Development Center (EDRAD) at the College, invited me to return to Hawai'i to take a position in the center and on the faculty of the College. I had not been in Hawai'i long when Everly asked me to consider heading the lab schools. (Unbeknownst to me, a college committee and Dean Everly had considered me for the position before I arrived in the islands.) At first I declined the invitation.

Later, in the fall of 1965, with others in EDRAD, I did staff work for Lindley Stiles on the Stiles Report. This work convinced me of the schools' potential as a curriculum development center. Although Stiles had presented a potent rationale for a new mission for the schools, no details of philosophy and approach had been worked out.

My work with a longtime associate, John (Jack) Brownell, was important in what was to come. Brownell and I had been fellow teachers at Punahou School in the late 1940s, had known each other as doctoral students at Stanford, and had been colleagues at Claremont Graduate School. In 1965 we were completing our curriculum book, *The Curriculum and the Disciplines of Knowledge: A Theory of Curriculum Practice* (Wiley 1966). Our work aimed to be a theory of *practice*, that is, a practical guide to designing and developing curriculum based on our theory. After reviewing the claims of social, occupational, religious, political, and intellectual domains on the curriculum, we concluded that the intellectual goal held the prime position for general education. In contemporary language, the general, liberal curriculum was to be discipline-based. The remainder of the book set out guidelines for developing curricula to fulfill the intellectual claims of the disciplines of knowledge, conceived as communities of people committed to working toward shared intellectual goals within their own domains. These communities would consist of practitioners of the disciplines, including academic scholars, teachers, educators, and finally students themselves, when their school courses would cast them in roles of community members, engaging with each other and their teachers in doing what members of such communities do—thinking, inquiring, learning their language, communicating, collaborating, using their methods of discovery, and so on.

My decision to accept the position of lab school director and to become engaged in converting the lab schools as envisioned in the Stiles Report was influenced by several factors: (1) my professional interest in curriculum design and development, as stimulated by the work with Brownell, (2) the emerging culture of educational change in the 1950s and 1960s, which made new approaches and developments possible, (3) the success of university academics in curriculum development—a hallmark of successful work in major curriculum projects in the 1950s and 1960s, and (4) the availability of fifty-five university-funded positions assigned to the lab schools—resources that to my knowledge were unavailable to any other curriculum design unit. With university scholars participating in curriculum practice, the revamped laboratory schools could become an organizing point for university faculty members and school people on our development teams.

Internal Reorganization

Converting the Laboratory Schools into a site for curriculum work entailed organizational changes—a continuing phenomenon in the unit's life. In 1966 we merged the three independent lab schools into a single University Laboratory School (ULS), along with their budgets. One principal replaced three, and a single cafeteria, rather than three, now served the whole student body. Three school nurse positions were directed to other needs.

The size and composition of the student population

changed. To accommodate the conversion of full-time teachers to curriculum developers, we reduced the student body by attrition from over 900 to 365. To carry out the research mandate, we selected students to represent the state's population in ethnicity, gender, level of school success, and families' social standing. Because changes were made by attrition, no students were eliminated. There was some early criticism of adding students from the great variety of walks of life, but it vanished when the school proved successful, safe, and attractive.

Staff roles changed from classroom teachers and supervisors of clinical practice to teacher-researchers. Only a few of the school's staff members accepted the opportunity offered to prepare for their new roles. Most chose to apply for other opportunities available, either in the Department of Education or in the College of Education. A number of those on the brink of retirement chose to leave. Thus we were left with a major job of staff building—recruiting educators and content scholars from Hawai'i, the U S mainland, and other countries.

Developing Partners

In building this applied research and development enterprise, we discovered step by step that we needed a large number of connections to individuals, groups, and institutions. Some of the connections were there from the start; others were cultivated later.

1. *The Hawai'i Department of Education (DOE).* The Department of Education has been an important partner and client through the years. Although interactions have varied in type and intensity with the times, and particularly with the views of the superintendent, the links have always been maintained.

Partnership with the DOE was one of Hu Everly's hallmarks for the prosperity of education in Hawai'i, and it proved to be so for the new lab school and for the curriculum development unit that was to follow. It all started in an informal way.

At a Phi Delta Kappa meeting, I had met William (Bill) Savard, then head of research in the DOE. We promptly began exchanging ideas on improving education. I talked about the lab school and the possibility of collaboration by members of the university faculty; Bill talked about DOE interests, including the research program under way at the DOE, and about the funds for educational innovation that had come to the state under Title III of the 1965 Elementary and Secondary Education Act (ESEA). We came to an immediate and enthusiastic meeting of the minds on what could come of joining the efforts of the state's two major educational establishments, both bringing substantial resources plus entree to the schools and the university.

Dean Stiles's report had noted the potential of joining in a partnership with the DOE-controlled Title III (Educational Innovations) program. This is just what happened.

We now saw that we had to move quickly. The state had to organize to spend its annual federal allowance of some $400,000—big money in those days. ULS people were eager to get moving along the lines suggested by the Stiles Report, which had been well received by the legislature, the university, the DOE, and the Title III Advisory Council, a body of community members that included Dave Thompson of the ILWU, cited earlier.

We proposed a jointly operated unit to be called the Hawai'i Curriculum Center (HCC). It would have resources from both the DOE and the university and a commitment to work on projects of high priority to the schools—first, English language arts for the elementary school, science, and the arts.

The original leadership group was drawn from both the DOE (Shiho Nunes, Joe Cherry, and Bill Savard) and the university (Gladys Koo, until then principal of the university's elementary school and Jack Brownell, new from Claremont Graduate School and me). I assumed the role of director; Savard of co-director, both of us expecting that these roles would either change regularly or that new leaders would be found. In my case, it never happened, and I have remained in a position close to the one that I accepted in 1966.

The combination of new and continuing staff was an energetic, creative, and hard-working lot: Leon Burton (arts); Jerry and Charlotte Dykstra, Richard and Ann Port, Florence Maney, Donald Sanborn, and Ted Rodgers (English); Ron Mitchell (social studies); Frank Pottenger, Don Young, Will Kyselka, Sister Edna Demanche, and Reed Brantley (science); Edith Kleinjans, Loretta Krause, Morris Lai and others too numerous to list here. They were an energetic, creative, and hard-working lot. When the work teams assembled, with faculty drawn from the DOE, from the University of Hawai'i, from mainland institutions, and from New Zealand, we witnessed the synergy of teachers and scholars collaborating to meet common goals. No one really knew which team members were drawn from the DOE, the university, or elsewhere, and if they did know, it wasn't important.

Because of Hawai'i's unique single statewide school system, the resources from Title III of the Elementary and Secondary Education Act supported much of the work. Where most states disbursed their ESEA funds among many small projects, Hawai'i chose to concentrate its share in the Hawai'i Curriculum Center. The policy offended some who would have preferred to put the funds into multiple pockets.

The Hawai'i Curriculum Center had a lively existence under that name from 1966 to 1969. Always a target of some controversy, the HCC's work was reviewed each year by the Hawai'i legislature under its budgeting authority. After an intensive review in 1969, almost all of the legislators came out

in support of the HCC. But one senior member, the chair of the House's powerful Budget and Finance Committee, held out for assigning full control of the HCC to the Department of Education, on the assumption that joint operations could not be well managed—hence the tension. So the unit was split into two. The university portion was renamed the Curriculum Research & Development Group; the DOE section was named the Curriculum Development and Technology Branch and assigned to the Office of Instructional Services. The two units continued to share quarters on the university campus, working together by contract or joint agreement and the professional good will of people on both sides. The DOE gradually dropped developmental work, though it kept up major support to its Hawaii English Project.

2. *Leaders in the University.* From presidents through vice-presidents, chancellors, and their staffs, university leaders also provided support, as did research officers and their staffs. Later, the Research Corporation of the University of Hawai'i (RCUH) also promoted the new activity. In the earliest days of the Hawai'i Curriculum Center, university administrative staff sought ways to expand the number of positions for the lab school. Unfortunately, their efforts were not successful.

3. *The College of Education (COE).* Hubert Everly, dean of the College, provided the initial impetus for the new mission of the lab school and maintained connections with the college and the university over the long haul. From the beginning to his retirement, he was the stable point, offering information and guidance, always delivered with good will and candor. Hu was committed to the success of the new laboratory school. He knew the university; he was a skilled lobbyist and a sensitive practitioner of local politics. He also knew his faculty and was committed to working closely with the DOE. He never discouraged an idea or an innovation, though he sometimes counseled me on timing.

College of Education faculty members had mixed responses to converting the laboratory schools to their new function. Some responses can be attributed to differences of educational philosophy, of views on teacher education, curriculum, and the wider set of issues in the conduct of schooling; to mixed opinions on teachers' roles in developing curricula, differing concepts of staff development, and even doubts about the very idea of large-scale, systemic development of curricula. Some responses reflected sympathy for teachers anxious about their changed role. Some staff members questioned severing the school's traditional ties with the college's teacher education programs.

But most college faculty accepted the new arrangements. Many staff members were welcomed by college faculty and worked with the college's academic and teaching departments. Most eligible CRDG faculty have taken appointments to the graduate faculty.

Members of the EDRAD staff offered valuable support in establishing the unit but directed their efforts to their own agendas and styles of research once it was under way. The university itself afforded access to experts in disciplinary fields to cooperate on curriculum projects. We estimate that over 600 faculty in all branches of the university have contributed their expertise to developing curricula in a variety of CRDG projects. Their assistance was especially important because of our commitment to the disciplines of knowledge as the foundation of a common, general, and intellectual curriculum.

4. *Other Connections.* Representative Patsy Mink was our link to Congress and our spokesperson with influential Washington heads, from the president down through the educational hierarchy, including administrators of the Title III program. University people and CRDG staff members often went to Washington to consult with national leaders on our behalf.

In later years, we forged effective working arrangements with many of the state's independent schools, with international schools and schools in Micronesia, and with many schools on the U S mainland. Over 7,000 schools in forty-four states now participate as partners in using CRDG-developed programs. In more recent years, we formed partnerships with sixteen mainland universities who serve as centers for disseminating and adapting CRDG programs in their service areas.

Analysis of the CRDG's Longevity

The late 1950s and the 1960s were the high point of large-scale curriculum projects in the United States, Britain, Australia, and other countries. Few of the centers that mounted these projects still exist. Even national programs of support to curriculum development have either shut down or lost their financial backing.

Yet the CRDG has persisted, even gaining in the scope of its work and in the wider use of its programs in Hawai'i, on the U S mainland, and in some other countries. Can we learn something from reviewing this longevity?

In concluding this article, I present ten conditions that I believe account for the CRDG's success and its longevity. They issue from my years as the director of the CRDG, from dialogue with colleagues, and from my contacts with and observations of the curriculum development movement elsewhere.

Condition #1. The CRDG has received predictable, long-term support.

Most projects and multi-project centers that depended on short-term government grants have folded. Few have produced a stream of income from sale of materials and services to continue their work.

Condition #2. The CRDG has benefited from its allocation of permanent university positions, enabling it to build a core staff of career professionals.

Most projects have used personnel drawn from schools and universities on part-time appointments or as consultants for the duration of their grants. They rarely devote enough time to become career specialists in what I once referred to as "the world's youngest profession." CRDG's key staff members have had the time to form insights into the curriculum development process and to become skilled in inventing curriculum-building strategies. The CRDG has also been able to build a corps of specialists—editors, artists, book designers, printers—to carry projects through to completion.

Condition #3. The CRDG's endeavors benefit from its affiliation with the university.

In addition to financial backing and personnel, the university provides the R&D infrastructure and services to carry out projects expeditiously. The CRDG's status as an organized research unit of the university gives it standing in academic circles.

Condition #4. The CRDG's work is grounded in a sound and internally consistent theory for guiding curriculum development.

The CRDG has found direction in my theoretical work with Jack Brownell on *The Curriculum and the Disciplines of Knowledge: A Theory of Curriculum Practice* (Wiley 1966). This work meshed intellectual knowledge (the disciplines) with the practical work of the schools. It has been the base for continued theorizing and practical application over time, and is consistent with the current movement toward educational standards.

Condition #5. The CRDG began small, developing curriculum for the state's schools.

Many early curriculum projects were assigned nationwide responsibility from the start. But the CRDG, charged with responsibility just for a small state, found that compactness, with direct communication, eased the tasks of designing, developing, testing, and debugging curricula and adding staff development programs before expanding to the national and international arenas.

Condition #6. The CRDG has allowed ample time for development, trials, and revisions.

A typical CRDG project allows five to eight years for initial development, trial, and early revisions of a comprehensive program. The more successful programs are usually revised after five years or so by the initial and still-intact development team.

Condition #7. The CRDG has found its dedicated laboratory school vital to its mission.

In the University Laboratory School, senior and junior developers work with students until they are satisfied with the results. Once ideas and materials pass initial levels of satisfaction, they are shared with cooperating schools. The laboratory school keeps the project models alive and serves as a base for evaluation, for visitation, for training, and for subsequent revisions.

Condition #8. The CRDG has been able to learn from the mistakes of other curriculum pioneers.

The CRDG started its work in 1966, when many American projects were available as models. The CRDG staff studied these projects, analyzing their work, their resources, their gaps, and their successes. The CRDG brought to Hawai'i a number of leaders of the still new but complete science programs to serve as members of advisory panels, and sometimes as writer/developers.

Condition #9. The CRDG has a number of independent projects.

Because most project centers completed only one or a very few programs, they had limited opportunity to learn from others. But the CRDG has had concurrent projects in several areas of the curriculum, thereby permitting staff members to learn from each other, and, as a result, shortening the learning curve.

Condition #10. The CRDG has the capacity to adapt to changing standards and conditions, adding new tasks and adapting existing ones to achieve its goals.

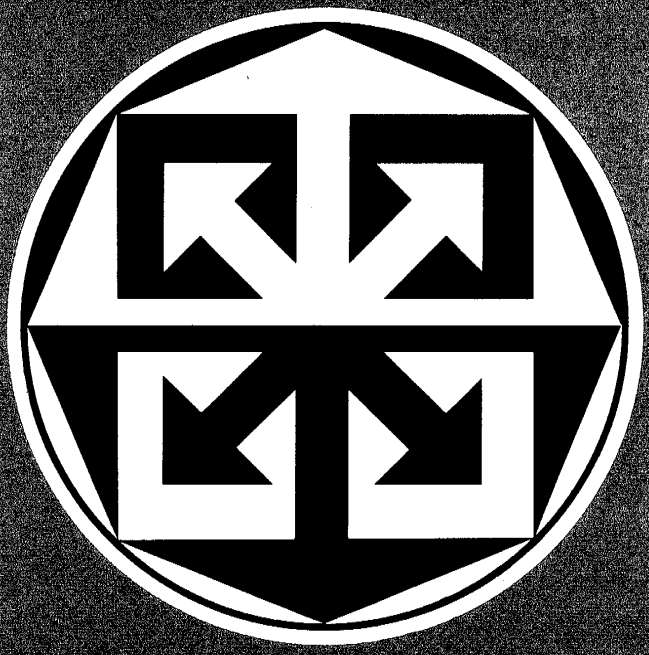
At first we naively assumed that once we had developed, tested, and refined a curriculum, it would find its way into schools by means unknown to us but assumed to be in place. We quickly learned that getting programs into schools is a critical part of curriculum work. So we gradually undertook other activities. Printing and publishing came first, along with professional development and follow-up support to teachers and schools. (We have had little success in contracting with educational publishers. None were willing to arrange for teacher in-service training, which we came to believe was essential for programs intended to change habits of teaching and learning.)

Circumstances favored the CRDG as it created and sustained a successful and relatively permanent center for curriculum research and development, professional improvement for teachers, and support to schools. Perhaps the lessons the CRDG has learned and the conditions that have sustained it can guide others who build experimental schools and project centers.

Arthur R King Jr is director of the Curriculum, Research and Development Group at the University of Hawai'i at Mānoa. He is the author, with John A Brownel, of the *Curriculum and the Disciplines of Knowledge: A Theory of Curriculum Practice.*

EDUCATIONAL PERSPECTIVES

JOURNAL OF THE COLLEGE OF EDUCATION, UNIVERSITY OF HAWAII



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C O N T E N T S

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Concerning this Issue . . .

This issue of Educational Perspectives is devoted to a new activity in Hawaiian education, the Hawaii Curriculum Center, and to the national educational context in which it finds its identity and purpose. From the national perspective, the Center is an expression of the increasing state/federal partnership, which is expressed through the increase in federal participation in education and through the great variety of state patterns for the expression of this partnership. From the state perspective, the Hawaii Curriculum Center is an outgrowth of long-standing activity by the University and the Department of Education, working for the most part independently, to improve instructional program and practices in classrooms throughout the state. More directly it represents a convergence of several significant developments in Hawaiian education which are reflections of trends evident nationally and even worldwide. Among them are 1) the growing recognition of the essential role of education in a modern Hawaiian society; 2) the increasing demand for quality in the face of rising educational costs; 3) the greater collaboration of University scholars and Department of Education personnel on curriculum problems; 4) the new role of service sought for the University's Laboratory Schools; and 5) the large-scale curriculum development effort in English, foreign languages, and the fine arts mounted under the Department's Title III, P. L. 89-10 project.

The Hawaii Curriculum Center is a joint activity of the Hawaii State Department of Education and the University of Hawaii, established to serve the State as the primary center for large-scale design and development in selected areas of the curriculum and for demonstration and evaluation of local, national, and international curricula. It has the secondary purpose of providing a site for research on curriculum problems and of stimulating and supporting curriculum-related activity throughout the State. In carrying out these purposes, the Center serves not only public, but also private and church-related schools.

In this issue *Patsy Takemoto Mink*, Congresswoman from Hawaii, presents the perspectives of a key legislator on the task of education today and the role of federal programs in support of education. Mrs. Mink, a member of the House Education and Labor Committee and its sub-committees on education, has given both shape and support to the federal program in education.

Nolan Estes is the recently appointed Associate Commissioner for Elementary and Secondary Education. His article gives the perspective of a key administrator in the Office of Education about the priority issues facing American education today. We note that these issues, if modified to local conditions, apply equally to Hawaii.

William G. Savard is Assistant Superintendent for Research, Hawaii State Department of Education, as well as Co-Director of the Hawaii Curriculum Center. Readers should note that Hawaii has a unitary state public school system, not the common system of semi-autonomous districts. He has posited the present emphasis of the Department on program definition, program building, and program budgeting, and noted the role of the Hawaii Curriculum Center in relationship to this new emphasis.

The first major project of the Hawaii Curriculum Center is the design and development of a curriculum program for the teaching of English in the elementary and secondary schools. *Shiho S. Nunes*, Associate Director of the Center and Project Manager of the Hawaii English Project, writes of the national and state concerns which led to the establishment of the project and sketches key characteristics of the project. Mrs. Nunes, one of the Center's founding members, was formerly State Program Specialist for English.

Gladys Y. Koo and *Ernest J. Cherry* are experienced school administrators in the Hawaii Public Schools and hold positions of Assistant Directors of the Hawaii Curriculum Center for University of Hawaii Affairs and Department of Education Affairs, respectively. They describe in brief form a number of activities presently in process at the Center.

Planning and evaluation are vital functions of project centers such as the Hawaii Curriculum Center. *John A. Brownell* is Associate Director for Plans and Evaluation. In addition he holds the University positions as Professor of Education and as Researcher, Education Research and Development Center. His article sets forth the Center's stance on planning and evaluation.

The guest editor has contributed his own observations of people at work in educational development activity, noting the promise and demands of this new type of educational service.

The pictures were assembled by *Lawrence Silverman*, Administrator, Media Services in the Center.

Comments on and inquiries about the Center's program are welcome. They should be addressed to The Director, Hawaii Curriculum Center, 1625 Wist Place, Honolulu, Hawaii 96822.

A.R.K.

The Modern Educational Developer:

Member of the World's Youngest Profession

Arthur R. King, Jr.

Professor of Education
Researcher, Education Research and Development Center
Director, Hawaii Curriculum Center

While my title is preposterous without doubt, it serves as a springboard to several introductory comments about educational development in its contemporary mode. First, educational development today differs from standard practices of the past, in objective as well as in theory, scope, and style of operations. This new activity requires greater involvement from an expanding circle of professional specialties and makes different and unexpected demands upon these professionals. Second, like its antipodean sister profession, which claims to be the world's oldest, the new activity is not always accorded the badge of legitimacy by established and "respectable" practitioners in the educative professions. Indeed its existence can either be seen as a threat to the professional establishment, or its activities politely omitted from common parlance within it.

The profession defined.

The new profession can be characterized as follows:

(1) Its purpose is to design, develop, evaluate, disseminate, and otherwise assist the schools in the use of new curricula and associated media, evaluation devices, teacher education packages, and consultative services. The term *educational engineering* is being used increasingly to describe this task.

(2) It looks to modern *research and development* technology and *systems theory* for its guiding notions. These guiding concepts will be explored later in this issue by Dr. Brownell; it is sufficient here to say that the systems view attempts to interrelate all essential aspects (subsystems) of the complex organism (system) under consideration. Some of the new profession's founding scholars were seasoned in RAND Corporation and its educational corollaries such as the Systems Development Corporation (SDC).

(3) It masses the talent of individuals from many relevant specialties — teachers, curriculum specialists, education scholars of many types, discipline scholars, evaluation specialists, media specialists, and researchers, among others.

(4) It requires the formation of well-resourced, long-term, specialized centers for the performance of its work. The work is typically team oriented rather than individual centered; most developmental projects require from three years upward of full-time effort by these teams to complete their work.

Clark gives some compelling facts and prognostications on the new profession in a recent paper.[1] He presents the following "Schema of Functions Necessary to a Program of Planned Change in an Institution or Social Process Field," which distinguishes between the traditional functions of the "researchers" and those of the "inventor," "designers," and "product testers."

RESEARCH FUNCTIONS

1. Conducting Scientific Inquiry
2. Investigating Educationally Oriented Problems
3. Gathering Operational and Planning Data (to provide a basis for long range planning)

DEVELOPMENT FUNCTIONS

4. *Gathering* Operations and planning *Data* (to identify op-

erational problems)

5. *Inventing Solutions* to Operating Problems
6. *Engineering* Packages and *Programs* for Operational Use
7. *Testing* and Evaluating Packages and *Programs*

DIFFUSION FUNCTIONS

8. *Informing* Target Systems About Packages and Programs
9. *Demonstrating* the Effectiveness of the Packages and Programs
10. *Training* Target Systems in the Use of the Packages and Programs
11. Servicing and *Nurturing* Installed Innovations

Clark notes the need for specialization of function, but at the same time he warns the older and better established research community against ignoring the functions of development and dissemination or cutting off those engaged in these functions from serious intellectual discourse with "pure researchers."

Clark holds that

> there are no significant numbers of educational inventors, designers, project testers, or demonstrators available in the current personnel pool. The techniques of research necessary to carry out these functions are poorly developed, e.g., product testing, experimental design, etc. The content of preparation programs for such individuals is ill-defined or nonexistent. . . . Attention will have to be paid to problems inherent in developing 'development' in the field of education if there is to be any long-range hope of establishing and maintaining useful distinctions in function.

Clark looks ahead:

> The look of the future in educational research will be composed of large, inter-agency centers housing large R and D operations. . . . Centers of research and development will emerge on a scale beyond anything presently in existence. And these centers will be in a position to influence and affect educational practice directly through constituent agencies and indirectly through the pressures of their quality production. To meet this challenge, local school districts, state education agencies, and colleges and universities will respond in kind with R and D components of increased size and potency.

Clark predicts that

> by the end of the school year 1971-72, the present R and D funding programs of the Office of Education alone would require 18,500 researchers, nearly 60,000 developers, and some 50,000 persons working directly on the process of dissemination or diffusion of research results. . . . This estimate does not account for funding by private foundations, other governmental agencies, or, more significantly, for the almost certain increase in local, state, and regional spending for R and D programs in education stimulated by the national programs.

The New Profession has Known Forebears

To establish the legitimacy of the new professional, his lineage should be noted. The perennial producer of units, courses, and course sequences is *the classroom teacher*. The most commonly cited strategy for curriculum development, that of Ralph Tyler[2], charges the teacher and the staff of teachers in a single school with the basic design and development task.

The teacher is still central to the new mode of work, but with differences. The most inventive and best-prepared teachers seem required; they are expected to deepen their training and productivity as part of their experience in the developmental center. They are assisted in self-development by close contact with scholars from education and from the disciplines of knowledge and inquiry, as well as through the educative experience of the design and development activity.

The teacher's professional life is modified: he is often asked to set aside his teaching role — part — or full-time — for a period of years. In contrast to his traditional and quite appropriate devotion of his full energies to his pupils, the teacher/developer is asked to maintain a scholarly detachment; to demonstrate an unproven and strange product on "his" children; and to refrain from adding his own style and insights during the product-testing period. The strain of "teaching vs. research," long a dilemma of the university teacher, enters the life of the teacher development specialist. Full- or part-time service in an R and D setting causes problems and irritations in the teacher's regular school. It is quite an accepted practice to release a teacher a few afternoons for service in a curriculum committee, but quite another to lose the full-time services of a valued teacher for a period of two to five years. It is a visionary principal who can see the payoff to his school program.

When the time arrives to select from available packages, the teacher has a key role. He will be bombarded by packages based on differing theories (or no explicit theory at all), by packages which lack full information, by packages in varying degrees of completeness and quality; and he will find time inadequate to try out and otherwise assess them all. Yet as long as teachers are accorded their traditional control over the selection of instructional materials, the teacher vote may well carry the day.

The final irony for the teacher in a developmental role is that, upon the completion of his special assignment, he is likely to be tapped for service in administration, teacher education, supervision, or other non-teaching service.

The second forebear to the new

profession, although one not often given his due, is *the textbook writer and publisher*. Two key decisions make a curriculum: (1) a teacher is hired (or assigned) and (2) an instructional materials package is adopted, handed down or, in a few cases, locally crafted; all other decisions or actions are of secondary value. The control over the curriculum by the publisher is of long standing. An interesting study could be made of the unsuccessful competitors to McGuffey's readers, the Blue Back spellers, Magruder's civics, and Tressler's English.

The new development movement recognizes the integral relationship between the materials designer/developer, the publisher, and the resultant school curriculum package. The Association for Supervision and Curriculum Development recently convened a conference of educators and publishers to consider the problem of setting criteria for the appraisal and adoption of "educational materials packages." The packages will increasingly contain a curriculum theory or orientation, an instructional strategy, a packet of pupil materials, associated evaluation devices, teacher aids, and films, books, and other media, among other features. Some packages will be so complete as to require little teacher inventiveness; some, indeed, may permit none. Such programmatic efforts as BSCS, CHEM Study, SMSG, and related projects in English and the social studies would have little exposure and usefulness had they not been picked up by publishing and marketing firms. The entry of IBM, Xerox, General Electric, and many other industrial giants into the educational publishing business foretells increased involvement in, and perhaps major control of, educational package design, development, and marketing.

The third antecedent to the new professional is the *curriculum development specialist.*

The curriculum specialist in the new professional version has many new challenges. The new skill of grantsmanship is required of him; he may find himself the manager of a large staff, composed of a variety of specialists doing a style of highly interrelated team work for the first time. His graduate training will not have prepared him for the requirements of the job, for indeed he is inventing his profession. He will find existing theories of curriculum, instruction, evaluation, and related subjects inadequate to the task. The specialist in *general curriculum* will make his contribution as a theoretician of general curriculum or as an administrator; the specialist in a *discipline* area of the curriculum, if he has a deep understanding of the field and its instructional aspects, will be a valuable member or leader of teams of teachers, scholars, and others.

The fourth ancestor of the new professional is the *media specialist.*

In the new profession, the media specialists, including both the librarian and the audio-visual specialist, fuse their special insights and skills with those of other members of the development team.

Among the first to see the power of systems theory, the audio-visual specialist is an essential member of the new profession. He is traditionally a student of the instructional equipment and instructional strategies used with this equipment. He has been heavily handicapped in the past by inadequate curriculum designs which could be served by media subsystems. The librarian will identify related collections of books, documents, and other materials needed to support the curriculum.

The most recent addition to the class of forebears is the scholar in the *academic discipline.* The active participation of the scholarly community is the hallmark of contemporary, large-scale curriculum development activity. The working models for large-scale development are found in the activity of scientists, language specialists, and, more recently, scholars in English and the social sciences.

The first efforts of the National Science Foundation were instigated by scholars who invited a number of teachers to participate with them. The other educationists (curriculum specialists, administrators, teacher educators) were rarely involved. A balance of participation marks most contemporary efforts, including the activity of the Hawaii Curriculum Center.

The participation of academic scholars, while necessary to the work of the development center, presents certain problems: Can the customary teaching and research tasks of the university continue, if valued members of the staff are on leave to serve development projects? Will sufficient numbers of scholars of quality work in developmental centers outside of the university for long periods of time? Will inventive work in development activity be accepted as "research" for promotion purposes? Will scholars be able to design authentic and teachable units for children in the lower schools? Experience suggests that these problems can be resolved satisfactorily.

Other professional groups are being drawn into the new educational development profession. Without expanding upon the nature of their service, one can name the evaluation specialist, the researchers, the systems engineer, the artist, and the educational administrator, among others. Each has new processes to understand, new theory to develop, and a complex set of human and pro-

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ment of federal funds under Title III of the Elementary and Secondary Education Act of 1965 and the services of top administrative personnel. It subsidizes the in-service training, dissemination activities, extra personnel, equipment, and materials needed for field location schools. Another important contribution is the participation of the districts and individual schools in the trial and evaluation of new curricula.

Community cultural organizations and professional societies collaborate on Center projects and activities where they share a common purpose.

With the general purpose of improving the instructional program in the schools, the Center operates to design, develop, demonstrate, evaluate, and assist in the dissemination of new courses in designated areas of the curriculum. Under the Title III mandate to the Center, the areas of English, foreign languages, and fine arts have been targeted for large-scale development. Thus the major project of the Center now is the planning, development, and testing of a comprehensive English language curriculum.

The courses eventually designed in a given area will give the optimum in 1) help and direction for teachers; 2) carefully designed materials of instruction; 3) provision for individualized instruction and independent study; 4) continuous evaluation of student progress; and 5) model equipment, library, and media collections in support of the new programs.

The Center performs another major function in the field trial and evaluation of courses developed elsewhere and the dissemination of results to the schools of the state. It carries on a continuing survey and analysis of significant trends and developments in curriculum, selects programs for exemplification in its Laboratory School classes, assesses their efficacy and applicability to Hawaii, and maintains contact with other schools using the same programs.

What has been achieved in the Hawaii Curriculum Center is a unique mechanism *within* the educational system to organize for systematic change on a scale adequate to the need. The strength of the Center lies in a structure which bridges the University, the schools, and the community. Within this structure teachers, scholars, researchers, and artists can come together to plan and study, write, and experiment. Only within a framework that promotes this systematic collaboration can solutions be found to the persistent problems of education.

Nunes—*continued from page 16*

proaches to the continuing problem of teacher reeducation are being sought, tried, and evaluated. In preparation for the dissemination work ahead, when the new curriculum will be tested on a statewide basis, eight teachers and curriculum specialists from the several districts have been brought to the Center for a year and two summers of study and practical experience in the project. The experience gathered in these various programs will form the basis for specific recommendations to the Department of Education and the University of Hawaii for future in-service programs in support of the new curriculum.

In the new English curriculum being formulated by the Center, certain characteristics will be evident of the theoretical framework it has adopted. There will be no age or grade structure, ability grouping, or tracking practices, no artificial barriers to progression, such as grade-level restrictions on books. Instead, the program will be conceived as a stream of study without end, with provision for a high degree of individuation, independent study, and inquiry; students will work in this stream in accord with their performance. What will finally emerge from the English Project is a prototype instructional program in English, grounded in theory, articulated from kindergarten to grade 12, evaluated in laboratory and field trials, complete with tested plans for dissemination to the schools of Hawaii and for large-scale in-service programs. If present plans for staff and resources are realized, the entire development process — from theory to design to production to pilot testing in selected schools — should be completed in four years.

King—*continued from page 13*

fessional relationships to understand and to learn to live with.

As a mechanism for educational development in the contemporary mode, the Hawaii Curriculum Center practices a comprehensive approach involving researchers, teachers, scholars, writers, designers, specialists in media, evaluation, and curriculum development, and educational administrators. This approach, plus its unique affiliation with the Department of Education, the University of Hawaii, the private and church-related schools, and the scientific and cultural agencies of the state, gives promise of high effectiveness in the task charged to it — the continuous regeneration of assigned segments of the instructional program of the schools of Hawaii.

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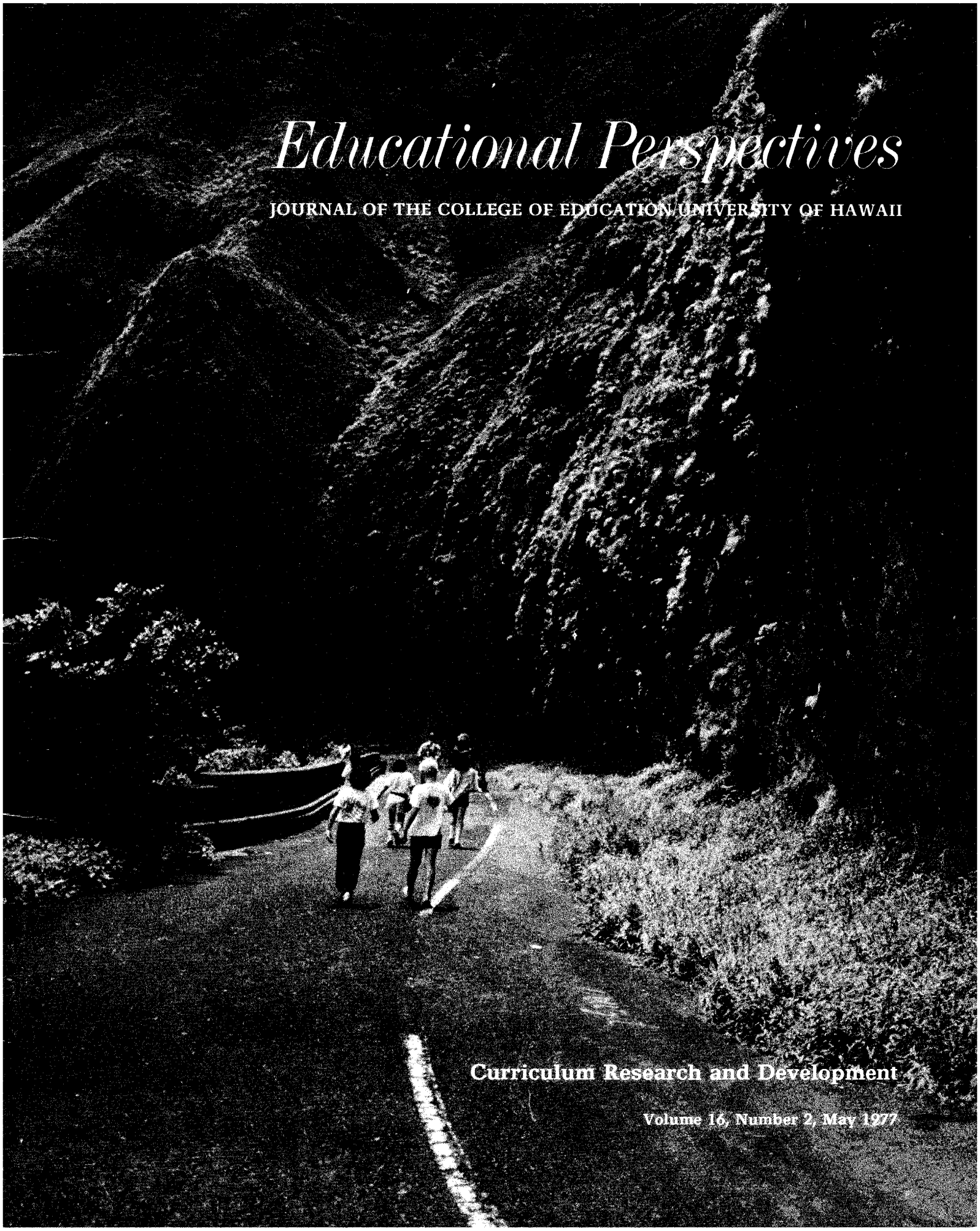
[1]David L. Clark, "Educational Research and Development: The Next Decade," *Implications for Education of Prospective Changes in Society*, ed. Edgar L. Morphet and Charles O. Ryan. Reports prepared for the Second Area Conference of Designing Education for the Future: An Eight-State Project (Denver: Project Office, 1362 Lincoln St., 1967).

[2]Ralph W. Tyler, *Basic Principles of Curriculum and Instruction* (Chicago: The University of Chicago Press, 1950).



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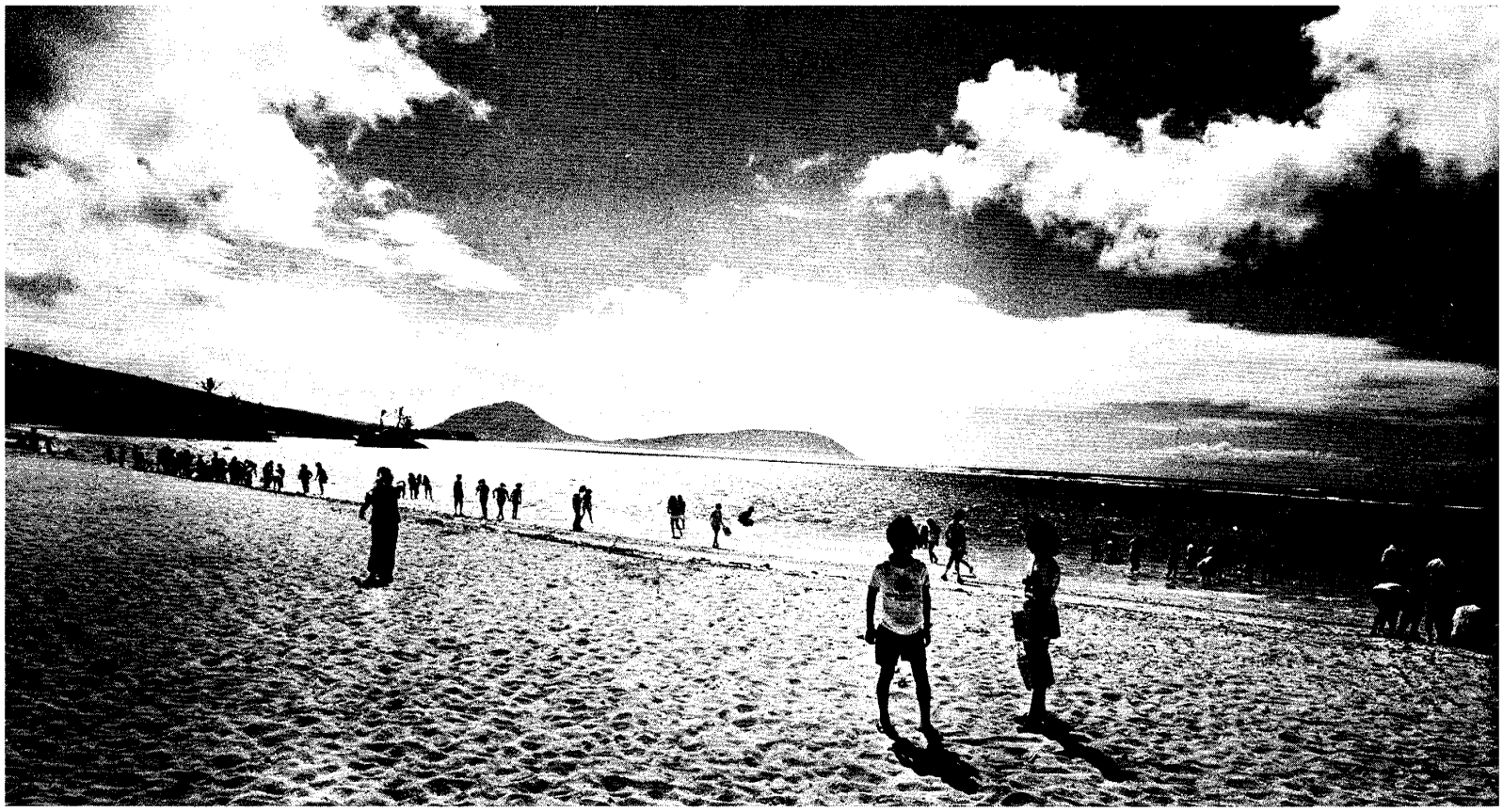

CONCERNING THIS ISSUE

This issue of Educational Perspectives is a ten-year report on the curriculum research and development movement in Hawaii as it has been lived and experienced by the Curriculum Research and Development Group (CRDG) of the College of Education. In a sense, it is an update of the issue of October 1967, in which the new staff of the Hawaii Curriculum Center, the original organization, laid out its plans and aspirations.

The eight articles of this issue, by senior members of the Group (now ten years older!), tell important parts of the CRDG story. Arthur King's article sketches the theoretical notions which began it all and the practical import of those notions. Frank Pottenger, Shiho Nunes and Theodore Rodgers look at the ten years — what was done and what was learned. Loretta Krause describes the changed role of the University Laboratory School, in itself an interesting story; Morris Lai discusses the special problems of evaluation in a curriculum research and development setting. Finally, the editors sum up with a look ahead to the next ten years.

It should be noted that although the articles are written from the CRDG perspective, the Hawaii State Department of Education, in its role in the curriculum enterprise, should be kept in mind. While not the focus of this series of articles, it must be regarded as a partner, the scene outside the laboratory school, and a key source of funds for some of the curriculum R & D activities discussed.

Recognition is made also of the contributions to Hawaii's educational program by other individuals and sections in the University, although they are not reported here. The important support of such activities as Sea Grant, the General Assistance Center of Hawaii, and the College of Tropical Agriculture — to note only a few — warrants a report on its own. We take pride in the full range of University contributions.

Hawaii is a small state, with less than a million total population and a public school enrollment of 170,600. Our story is about one state's efforts in systematic curriculum research and development. This experience and the model of action cannot, necessarily, be transported and replicated elsewhere. Yet we have challenged assumptions that have been common and learned a number of things. We share them in this issue.

Associate Editors

Richard H. Hinze, Arthur R. King, Jr., D. Loretta Krause, Shiho S. Nunes

TEN YEARS OF CURRICULUM RESEARCH AND DEVELOPMENT IN HAWAII: WHERE HAVE WE BEEN?

Richard H. Hinze, Arthur R. King, Jr., D. Loretta Krause, Shiho S. Nunes

History

Since the early Sixties, systematic curriculum research and development on the local, national, and international scenes has been emerging as a field of practice and supportive theory in its own right. A considerable body of experience has been accumulated in many dozens of projects here, on the Mainland, and abroad. Efforts to study the assumptions, practices, problems, and conclusions of these projects have been continuous to discover principles useful for understanding and effecting curriculum change. Hawaii's experience can add to this growing pool of curriculum knowledge. Such knowledge, it is widely agreed, can lead to a more realistic assessment of what systematic research and development can or cannot achieve — hence to a better understanding of its full potentialities as well as weaknesses.

The start in systematic curriculum work in Hawaii came in 1966, when the State of Hawaii established the Hawaii Curriculum Center, a state educational laboratory. The Center was the child of mixed parentage. The University of Hawaii was looking for a new role for its Laboratory School; it made a major commitment to curriculum research and development of a new direction. The Hawaii State Department of Education decided to apply its allotment of Title III ESEA funds for educational innovation to a long-term project to do something fundamental; its commitment was to improve language and the communicative arts, a sensitive educational issue in Hawaii. The two interests were merged into a joint activity under a single name, the Hawaii Curriculum Center; its purpose, to work systematically on curriculum problems. The governing boards of the two agencies and the State Legislature approved the arrangement. Their support, and that of a strong community advisory council for Title III account — in large measure — for the continuing life and productivity of the curriculum development activity in Hawaii.

In 1969, the University and the Department of Education developed a formal Joint Agreement for cooperation in curriculum work and, at the same time, took separate names. The Department of Education organized its effort under the Curriculum Development and Technology Branch (recently changed to Curriculum Materials and Services Development Section). The University's efforts continued as a branch of the College of Education, but took a new name: Curriculum Research and Development Group (CRDG).

Because of this history of close association, systematic curriculum research and development has come to be regarded as an integral part of educational planning within the overall framework and objectives of the educational system. Much of the work has been carried out by CRDG, either under contractual agreement with the Department of Education or with its own allocation of University (state) funds, federal funds, and foundation grants. Other projects have been conducted by the Department with varying degrees of assistance from CRDG. In either case, a high degree of cooperation and collaboration has been obtained between the two state agencies.

As defined by practitioners in Hawaii, systematic curriculum research and development is a continuous and comprehensive process of planned change aimed at the classroom teaching/learning situation. The process involves the identification of needs, the application of research, the design of prototype teaching and learning materials, the testing and revision of these prototypes in cycles of expanding trials, the mass procurement of the finished materials, and the dissemination and implementation of the completed program. The qualifier *systematic* implies that the total process is carried out in a rational, organized way, with appropriate attention to all factors that affect each stage of the process.

The work of design and development is usually

organized into projects, with teams of teachers, scholars, evaluators, curriculum theorists, and media specialists working together. The projects are supported for periods of five years or more, with additional time allowed for refinements. More often refinements are made annually under a system of continuous feedback from the users of the curriculum.

CRDG Output

Hawaii's experience with this way of bringing about curriculum change is now ten years old. During this period, CRDG has engaged in fifteen major statewide projects and a lesser number of minor ones. The output of the completed projects has been considerable, but rather more unusual is Hawaii's high user rates of these products.

Table 1 shows the number of students and teachers involved in testing and/or using the programs completed or in progress for the period 1970-1977. The table also projects figures for expected use for the five-year period 1978-1981.

Some General Conclusions

The extent of experience represented by the data in Table 1 leads obviously to these questions: What have we learned from all this? What of significance do we now know that we did not know ten years ago when we began? Our conclusions about specific aspects of development and installation are too numerous to mention here; some of them will be discussed in the other articles of this issue. Moreover, in the curriculum business, most conclusions are tentative and tenuous. Over the past ten years, however, our various experiences have led us to certain general conclusions which add up to optimistic prognostications for the future of systematic curriculum research and development work in Hawaii.

First, we are convinced that Department of Education/University of Hawaii cooperation in curriculum improvement activities can be maintained over long periods of time. The common goals held by both state education agencies provide enough cohesive force to overcome the differences that occasionally arise.

Second, we believe that the combined talents of teachers and researchers from these two institutions are sufficient to develop curricula of high quality. Hawaii-developed programs have (1) Hawaiian and Pacific content; (2) validation for Hawaii's students, and (3) training and support for their best use.

In addition to these advantages, project curricula and the training and support that accompany them are strong stimuli for teacher growth, intellectually and professionally. They are also significant influences for schoolwide planning and change. The evidence is convincing that when change is approached in a systematic way with the concurrence of schools and faculty, the quality changes tend to survive.

Our conclusions about our teachers are also on the upbeat. We have found that teachers here, when assured that support will be available, are ready and eager to adopt and use Hawaii-developed curricula and materials and are willing to devote time and energy to necessary training. These attitudes seem to be enhanced when the right conditions of support and assistance are present. Although not many of them can develop curricula and materials successfully without assistance and time off from teaching, most of them are able to choose well from available programs, successfully adapt, personalize, extend, and build them into coherent programs for their students. Some of those who have been actively involved in our projects become teacher-developers themselves, important focal points for change and improvement in their own schools and districts.

A final point sums up perhaps the most important conclusion of our decade of work. It is an affirmation of a belief we began with — that curriculum vitality is best developed and maintained if schools have available to them a strong, integrated, well-resourced cone of support services in the way of curriculum designs and materials, adaptations, demonstrations, evaluation, training, consultations, and others. These services and the stimulation they provide must be aimed directly at the classroom and the transactions that occur there. And their provision must be as important a feature of educational policy as the staffing of the schools.

Table 1
STUDENT AND TEACHER USE OF PROGRAMS DEVELOPED BY CURRICULUM RESEARCH AND DEVELOPMENT GROUP**
(ACTUALS AND ESTIMATES)

4/11/77

		70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82
Hawaii State Dept. of Ed. (DOE) Developed with CRDG Support:													
1. Hawaii English Program (HEP)— Elementary (K-6)	S*	14,850	51,419	54,017	53,064	52,167	53,729	49,310	51,430	51,440	51,440	51,440	51,440
	T	831	1,911	2,194	2,317	2,817	2,817	2,817	2,817	2,817	2,817	2,817	2,817
2. Artists-in-the Schools (K-12)	S	116,000	105,000	122,000	114,000	99,000	99,000	123,750	123,750	124,000	124,000	124,000	124,000
	T	4,436	4,015	4,605	5,360	3,790	3,787	6,000	6,000	6,000	6,000	6,000	6,000
DOE Initiated and Contracted to CRDG for Development:													
1. Hawaii English Program (HEP)— Secondary (7-12) (including Mainstreaming)	S		175	603	680	1,080	3,440	7,012	17,692	25,000	31,500	37,000	44,000
	T		6	17	18	22	35	100	230	320	410	500	600
2. Hawaii English Program (HEP)— Elementary Mainstreaming (K-6)	S								903	903	903	903	903
	T								301	301	301	301	301
3. Multicultural Awareness (Social Studies) (4-9)	S						260	1,250	1,620	3,000	6,000	12,000	25,000
	T						8	40	45	80	100	250	500
4. Consumer Education (K-12)	S						1,080	2,160	4,000	8,000	12,000	16,000	25,000
	T						36	36	65	130	195	260	400
CRDG Initiated and Developed:													
1. Foundational Approaches in Science Teaching (FAST) (6-10)	S	1,575	5,610	6,930	8,500	9,000	10,000	10,250	10,250	12,000	14,000	15,000	16,000
	T	20	72	88	108	115	127	130	133	160	180	190	200
2. Japanese Language & Culture (3-12)	S		2,000	5,000	6,000	6,075	6,890	7,000	7,000	7,000	7,000	7,000	7,000
	T		14	45	58	60	63	65	65	65	65	65	65
3. Music (K-12)	S	1,482	1,500	2,000	3,000	15,000	20,000	34,200	35,700	37,200	38,700	40,200	40,200
	T	15	30	40	50	200	450	900	1,400	1,900	2,400	2,900	2,900
4. Metric (K-6)	S			150	287	2,100	8,000	16,000	25,000	35,000	45,000	50,000	50,000
	T			4	12	95	95	700	1,000	1,400	1,800	2,000	2,000
5. Pre-School Teacher Development	S				150	300	750	1,275	2,250	3,525	4,950	6,675	8,625
	T				10	20	50	85	150	235	330	445	575
6. Intermediate Mathematics (7-8)	S						300	700	1,900	4,000	8,000	11,000	14,000
	T						3	8	25	50	70	120	150
7. Nature Study (K-6)	S						300	500	3,000	9,000	18,000	27,000	36,000
	T						15	20	100	300	600	900	1,200
8. Marine Science (10-12)	S								1,000	2,000	3,000	3,000	3,000
	T								20	40	60	60	60
9. Marine Social Studies (11-12)	S								150	4,000	6,500	7,500	8,000
	T								30	80	130	150	160

*S=Student, T=Teacher.

**As an aid to estimating the user-rates of these programs, note that the public school system of Hawaii has ranged between 13,000 to 15,000 students per grade level.

CURRICULUM THEORY AND EDUCATIONAL CHANGE PROCESSES: Comments on the Role of Curriculum Theory in the Hawaii Curriculum Research and Development Group

Arthur R. King, Jr.

The work of the University of Hawaii's Curriculum Research and Development Group is guided to large degree by a single curriculum theory. The theory is one explicated by my former colleague, John Brownell, and myself in our 1966 publication, *The Curriculum and the Disciplines of Knowledge: A Theory of Curriculum Practice.* [1]

The work was a derivative of the Bruner, Schwab, and Phenix thinking of the early Sixties. It strongly asserted the significance of the disciplines of knowledge as a productive way of entering into the problems of curriculum theory and the practical processes of curriculum change. The heart of the theory lies in its definition of what intellectual activity is like. The intellectual realm, constituting man's use of symbols, is held to be the basis for liberal and general education. Intellectual life is established to be a set of semi-independent disciplines, or communities of individuals who share a common dialogue. More specifically, each discipline tends to reflect common characteristics:

- a community of persons,
- an expression of human imagination,
- a domain,
- a tradition,
- a syntactical structure — a mode of inquiry,
- a conceptual structure — a substance,
- a specialized language or other system of symbols,
- a heritage of literature, artifacts, and a network of communications,
- a valuative and affective stance,
- an instructive community.

Our book never made the best-seller lists, but, as the shifting currents of popular curriculum talk changed and moved away from the disciplines of knowledge theory, we stuck with our ideas. Our subsequent attempts to influence the design of new curricula and to assist teachers to use them have been based on these ideas.

Rarely does a curriculum theorist have the opportunity to test his words. We had that opportunity in Hawaii and would like to give an initial report on that experience.

Most, but not all, projects at the Hawaii Curriculum Research and Development Group use the discipline theory. Project heads are expected to find the best solution to the curriculum problems facing them. A variety of approaches has the advantage of providing contrastive experiences for comparison.

The first effect of the theoretical work we did was to crystallize our thinking about the state of the art in educational change and to give us the desire and courage to try to do something about it.

Second, it gave us a rallying point around which to gather scholars and teachers who were also interested in the problems of educational change. The theory provided a fairly well-defined educational point of view with which a surprisingly large percentage of scholars and professionals were able to identify.

Content scholars found a ready home in our new enterprise at the University of Hawaii. The theory not only defined and dignified their work; but our Curriculum Research and Development Group offered an avenue to actualize the educative aspects of their specialties for the lower schools. They have performed marvelously (and mostly for free) on our various projects. A large number of teachers were similarly attracted. Their great value has been in imparting a strong reality base to the work that we do. On the other hand, there was a mixed reaction from our colleagues in teacher education, many who found the theory unacceptable and continue to remain unconvinced of its validity and value. Interestingly the theory found support among the majority of school board members, state legislators, and general citizens.

From our experience we can draw some tentative conclusions about how educational theory is received by different segments of the education community. We know that a specific curriculum

theory can both draw and repel people and we have some idea about what particular features of the theory are likely to attract or repel what groups of people. We know that school administrators and teachers are practical people; they want concrete products, materials, and designs in usable forms, not theories, concepts or promises.

A third effect of our theoretic stance was that it gave us a sound basis for staffing our center. Our notion of the "community of discourse," which includes scholars, practicing disciplinarians in the world of affairs, teachers, and students, gave us our formula for staff composition and development. It has been a potent model, and we have found that any design team which does not have a mix of these discoursers is faulted. Our theory also recognized the special role of the curriculum theorist, so that each project has had one or more persons of this stripe, preferably the project leader, although there have been exceptions.

A fourth result of our use of theory can be seen in our approach to the design and development of curricula. Four major elements form the core around which the work of design and materials creation proceeds: knowledge, learners, instruction, and administration.

Our planners undertake a rigorous examination of the possible knowledge bases for the curriculum: What disciplines are relevant? What does each of them do? What thinking styles, what values, what powers of imagination are captured? How instructive is the community for the young? What are the payoffs of alternative approaches? And so on — a series of penetrating looks at what is proposed.

The learners for whom the curriculum is to be designed are also carefully studied: age groups, grades, developmental stages, special characteristics, presumed interests and expectancies, social background, achievement levels expected, learning characteristics, and others too numerous to mention in this brief statement.

We also account for much of the instructional dimension, including the role of the teacher and the administrative structure that the curriculum is to fit, including, the matter of approvals and assents that must be forthcoming if the curriculum is to be used.

We have found that approaching the curriculum problem from this perspective of the disciplines of knowledge may well have substantial advantages over other approaches. Since our theory emphasizes the "community of discourse" among scholars, teachers, and students with the curriculum itself as part of the discourse, we tend to see the unity of these elements. We are not troubled by the dichotomies of either a student-centered or a subject-centered curriculum. I imagine less power in curriculum theories that find their initial home in the social or political ethos, the instructional dimension, or in the student and his particular needs, to name a few.

For example, Foundational Approaches in Science Teaching, a curriculum project discussed in a later article of this issue, used the theory of the activity in science to postulate roles for the student and the teacher — the student as *investigator,* and the teacher as *principal investigator.* These authentic scientific roles work especially well in the junior high schools even for the slow students. And the teacher can operate as a person of authority without the embarrassment of not knowing the fine points of the subject under study.

In the Hawaii Music Program we were similarly guided to examine roles in the community of musicians. We discovered that most of them engage in a set of musicianly activities: listening, performing, practicing, composing, conducting, critiquing, and theorizing. The project planners wove these activities into the music program at the appropriate levels, starting with the very young. One has a delight in store to see third graders conducting the class in a presentation of their own compositions. The performance becomes possible because the program offers the intellectual and technical tools for learner and teacher.

A fifth result of our theoretic stance can be seen in the development of the University Laboratory School, which is an important part of our establishment. The school has become an incubator for new ideas, a genuine laboratory for the early testing of innovative ideas and curricula.

It is a small school, with pupils from preschool age through high school. Its composition — ethnic, socioeconomic, and achievement — is representative of all student groups in the State of Hawaii, reflecting another aspect of our basic theory.

The school has provided us with a testing ground for another one of the assumptions of our theory of curriculum practice — that every student can and should engage in continuous interaction with the major intellectual areas throughout the school career. Our students, elementary and secondary both enroll in the major subject areas each year they are in school. Thus, every student now takes English, social studies, a foreign language, music, art, science, mathematics, and physical education. In addition, most of them participate in competitive athletics and student activities. To attain this goal required the invention of a schedule permitting nine specific offerings. Without our theory, it is doubtful that we would have had the ideal and the leverage to make such substantial changes.

Our curriculum theory has been significant in what it has kept us from doing as much as it has been instrumental in what we have done. Our theory is quite explicit in urging caution in the so-called integrative and inter-disciplinary approaches. We have been cautious in our claims and careful in their use, approaching them much more gingerly than have many other projects. We are gaining experience and becoming more consistent in our attacks on the problem, but we are always careful, making certain that integration does not destroy the authenticity of the intellectual building blocks that exist in the intellectual world today. A key idea of our theory requires us to take the disciplines of knowledge as they exist, not as one would want them to exist or think they will exist. This stance has kept us out of much difficulty.

We have also tended to avoid curriculum themes which find their base in personality theory, organizational schemes, instructional tactics, and other non-disciplinary structures. Individualization, student motivation, modular scheduling, team teaching, worthy as they may be as features of a program, are not fruitful bases for curriculum design.

Our particular theory has been of some help in guiding evaluation work.

Finally, there are some problems where our curriculum theory has not been of much help. It has given only sparse guidance to the development of curricula for the teaching of direct skills, such as reading, writing, typing, listening, speaking, etc. These skills exist in the realm of human capacities and are not illuminated adequately by theory — at least theories we could use.

Footnote

[1] Robert E. Kreiger Publishing Co., Inc., New York, Reprint 1976. Original Edition by John Wiley & Sons, 1966.

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Arthur R. King, Jr.

"Challenge to Laboratory Schools: Finding a Niche"

William Van Til

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Challenge to Laboratory Schools: Finding a Niche

Arthur R. King, Jr.

Introduction

We are here to talk about laboratory schools. They have been the focus of my professional life for the past seventeen years and an important concern of most of you here. Campus laboratory schools in the United States number about a hundred, situated in colleges and universities throughout the country. Each laboratory school has its special history, unique opportunities, successes, difficulties, resources, politics, and other features of complex organizations. Thirty years ago there were two hundred laboratory schools, more or less, in our ranks; since then about half have lost their support and passed into history. A number of them were in our most prestigious graduate institutions. Most of those that remain are not "sitting pretty"; many face serious difficulties. It would be optimistic indeed to assume that all will survive the decade, even though some are prospering with new or revitalized programs, and several universities are considering establishing new laboratory schools.

It may be comforting to us—and also instructive—to note that laboratory schools are not the only social and governmental institutions under attack. Teacher education in general is the target of heavy criticism from the profession and the community. Universities are not immune. Who could have imagined twenty years ago that the courts and the legal profession would be so heavily criticized and that medical and other health services would be so widely questioned? The criticism of laboratory schools is part of a pattern of aggressive questioning of all public services and professions.

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The nation seems ripe for reforms in all branches of education, including those branches associated with the university or college: preservice teacher education; preparation of administrators, counselors, and other school professionals; in-service education of educational personnel; research; development; evaluation; and educational improvement efforts. The reports, speeches, and other literature associated with proposed changes rarely if ever identify laboratory schools among the resources available to bring about needed reforms. One could say that laboratory schools are invisible; or perhaps they are visible but not credible. Certainly we can conclude that the potential of laboratory schools for an important role in educational changes to come has not been developed or communicated.

Criticism is not necessarily bad. It can be interpreted as evidence that the public is aware of our function and expects a higher grade of service. The nation has a noble though somewhat naive notion of education as a formative agent in American society. Schools are held responsible for fulfilling the dreams of social justice, patriotism, social and economic mobility, public morality, equality, and the good life in addition to the perennial academic and other instructional goals of schooling. When we don't deliver—and we usually don't, of course—the public is confused and angry and insists that changes be made. Yet in such troubled times we can plant the seeds of new visions, of greater vigor, and develop the programs that come closer to meeting the needs of our times.

We cannot escape public scrutiny and criticism. Nor can we escape the evaluation of peers and administrators in our universities and colleges who allocate resources and judge the appropriateness of our work. We can neither hide nor dodge the flak. Our only strategy in such times is to be vigorous in planning and carrying out our programs.

Visualizing Our Potential

Polya, the great mathematician from Stanford, in his notable book on problem solving in mathematics, suggests a number of problem-solving strategies. One strategy is to pick a comparable problem from a different area and examine it, thereby gaining some insight into a solution of the original problem. To illustrate this process I will draw two problems from the field of technological change for brief discussion and application to the problems

of defining what our roles are and deciding what changes we must make in laboratory schools. A "technology" is a structure created by humans to do some necessary work. In this sense I consider medicine, social work, psychotherapy, jurisprudence, finance, education, engineering, and manufacturing as technologies.

Let us suppose that eighty years ago we were in the business of making and selling wood-burning cast-iron stoves. Ours was a stable industry with a predictable market. Every home and workplace had one such stove or more. But things happened. New construction materials such as steel and porcelain were developed; new fuels such as kerosene, gas, and electricity appeared. The demand for our product evaporated. What is the message? If we had stayed with our traditional product, we would have seen a huge decline in sales, profits, and the viability of our company. If, however, we had revised our vision of the function of our firm from being in the cast-iron stove business to being in the larger stove business or in the heating business or in the iron business, or even in the general manufacturing business, we could have modified our definition of our work and survived.

Our second example is the cloth diaper business. I'm speaking here as a parent of an earlier generation, highly familiar with the product. If we had stayed with the cloth diaper as our sole product, we would have suffered from the introduction of the disposable diaper. However, if we had envisioned ourselves as being in the baby diaper business or in the baby accessory business, or perhaps in the baby clothing business, we would have had the flexibility to innovate and survive changes. The point is that we must keep an open, creative vision of our enterprise to avert obsolescence.

Let's use these examples of technological change as bases for thinking about laboratory schools. What enterprise are we in? Are our activities as viable as they once were? Will they continue to be viable? If not, what functions should we add or substitute? If changes are needed, how would we go about choosing them?

If we go back to our examples, we note that the industries that survived chose new products related to their expertise and experience. They may well have capitalized on their reputation by using their old brand name on the label for the new product. They may have examined their environment (their "market") for new materials, new needs, and even new consumers. They would have done careful technical and market research into possible new products, and they certainly would have stayed within the financial limits of their organization. If their company

had been absorbed by a larger multifunction corporation (comparable to a teachers college being absorbed by a comprehensive university), they would have found it necessary to sell the revised functions to the corporate leadership (the university administration) in order to compete with other branches of the new firm.

We all know what we in laboratory schools have been doing. We've handled practice teaching and observation, as well as other forms of clinical practice; we've done a fine job of delivering education to children of faculty members and other parents who can pay tuition; we've supported faculty research in departments of the university; we've done classical descriptive and analytic research; we've done curriculum modeling; we've done curriculum development; we've done in-service training; some of us have done publishing; many of us have done consultative services to schools.

But beyond these, what other possible functions are there for laboratory schools? Is our role in teacher education changing with the introduction of wholly graduate programs? Will our commitment to classical research be replaced in part by product research, policy research, and evaluative research? Can laboratory schools provide some new kind of service related to new possibilities for educational improvement? Is the work of the laboratory school to be campus-oriented, or can it be profitably oriented to cooperative programs with the schools? Is our arena of service the nearby school system, the state, the region, the nation, or the international field? What changes of view are necessary to entertain these and other possibilities? What holds the greatest potential for the future? What services could be unique to the particular possibilities of campus laboratory schools without overlapping those of other educational improvement structures? Will the university or a school system, a foundation, or a federal agency be willing to pay for new services?

Finding the Laboratory School's Niche

From this wide circle of programs and services being provided by one or more laboratory schools, or those hypothetically possible but not now being provided, each laboratory school must find its niche. The term "niche" is used by environmental biologists to identify the particular place within the larger environment that permits a species to exist. For example, a plant, a bug, or a

fish exists in a narrow range of environmental conditions that permit it to sustain life, to interact with other species, to reproduce, and to gain necessary protection and resources. If this environment changes because of pollution, changes in other species, or the introduction of new predators, the particular species may find itself in jeopardy. It can survive only by moving or changing: it must find a new niche or adapt its old one.

Applying this metaphor to the laboratory school, we note changes in the structure of American education—new ideas, new needs, new possibilities, and the discrediting of old ideas, needs, and possibilities—which would make change in each laboratory school's niche desirable, even necessary. In my seventeen years with the laboratory school in Hawaii we have "re-niched" profoundly twice and in minor but important ways each year. We have changed types of work, products, staff assignments, staff qualifications, organizational structure, relationships with the rest of the college of education, relationships with the schools, and other features of our laboratory school's purpose, function, and character. Studying our niche and its larger macroenvironment is a constant task. My colleagues and I expect to be doing it as long as we are active in this work.

An Earlier Environment for Laboratory Schools

Arthur Foshay, a brilliant educator from Columbia University, described the context or environment of laboratory schools during their founding period early in this century. It was a time of sweeping inventions—the automobile, the airplane, electrical energy, communication media, and the Linotype machine. Basic discoveries were being announced in the behavioral sciences. Major political reforms were just being brought to fruition after centuries of struggle.

People throughout the western world believed that the potential power of the human mind was without limit. In the field of education we were emerging as a separate field and had confidence in our growth and power. Great figures were giving leadership. The testing movement held promise to sweep away superstition and to lead us into scientific views and methods.

The first laboratory schools were founded during this time, and early leaders such as Colonel Parker and Professor Dewey had every reason to believe that the schools had fantastic potential. With a new feeling of freedom to inquire and to experiment,

along with a new attitude toward the nature of childhood and children's potential for learning, the laboratory school seemed the most natural step in the world of education. New laboratory schools were formed all over the country during a period of two decades, all of them part of a great march toward the new education.

Today's Environment for Laboratory Schools

Such was the environment within which the original laboratory schools found their niches. What does the environment look like today? It is my belief that the true larger role of laboratory schools is educational improvement. How would I describe the educational improvement industry?

First, the educational improvement industry is extremely large and complex. We have regional laboratories; R & D centers; school support centers of various types; aggressive dissemination/diffusion systems such as the National Diffusion Network; information systems such as ERIC; national task forces established by state and federal governments and by private organizations; teacher centers; multitudinous federal, state, and local educational improvement programs; programs and schemes supported by educational foundations and professional organizations; accreditation systems; curriculum development and dissemination programs; commerical enterprises and educational publishers; staffs of educational consultants, supervisors, and other educational support workers at school, district, and state levels; and policy study groups. They exist in an unorchestrated set, competing with each other for resources and for the attention and support of teachers and school leaders.

The range of improvement objectives is also great, and various mechanisms to achieve them are presently attempting to affect the schools. Values education, sex education, environmental education, marine education, multiethnic education, the school environment, computer education, mainstreaming, basics, dropout prevention, and thinking skills are among the fifty or more topics being proposed for school change in my region. Obviously the country wants educational change and is willing to pay for it.

What is the place of laboratory schools in this set of educational change enterprises? First, I have said that we are not highly visible; we are rarely mentioned in the literature of educational change. More important, what is the role of laboratory schools

in the future? Will all, or most, or some of them be in the new set of survivors? The answer will depend upon how well we take advantage of our innate advantages.

The Innate Advantages of a Laboratory School

What are the innate or natural advantages of a laboratory school over other agencies attempting to bring about educational change and improvement? First, the laboratory school can be a necessary bridge between the university and the schools. Without this bridge the university's power to influence education is diminished. Professors do not have a reality base in their thinking about education. We would hardly recognize a professor of surgery who had performed no operations in the past ten or twenty years or a professor of accounting who was not reasonably active in his field. Yet most of our college of education staff members have not interacted directly with schoolchildren or their parents or teachers for years. Opportunities to blend theory and practice are greatly enhanced by having a campus laboratory for developing these links. We have found that professors in the arts and sciences, as well as those in professional schools, are quite willing to use the laboratory school environment for making a contribution to the schools.

Second, the laboratory school is a source of ideas and stimulation. We commonly get most of our ideas by reading each other's articles and reports and by researching someone else's practices; rarely do we have the opportunity to have direct experience with students, teachers, parents, and the multitude of problems and influences that make up the real environment of education. From this direct experience we get the ideas and the concepts as well as the deeper, and probably more profound, insights that remain subconscious. My own learning in education has come in large part from the laboratory school, where I am constantly forced to ask Why? or Why not? and to challenge the conventional wisdom.

Third, the laboratory school has a national advantage as the basis for educational experimentation, demonstration, modeling, and training. Many of our educational leaders from John Dewey to today have been educated in a laboratory school. Former laboratory school teachers and administrators in my state occupy a large number of positions of leadership. Laboratory school people are very visible and attractive. Most public schools do not

want first-level research or development or innovation done at their schools; they want it to work well somewhere else before they will try it. The laboratory school is prepared to take such risks because students and parents are knowledgeable about the change process and agree to it when the child is enrolled.

Also, the laboratory school can select its students to fit the experiments and demonstrations it performs. Our school in Hawaii purposefully draws a sample of students from across the ethnic, socioeconomic, and learning levels of the general population of the state in its attempt to achieve a representative range in each dimension. This kind of student body has helped both our research and our credibility. Visiting teachers often say, "Why, your kids look the same as mine."

I like the idea of having experimental teaching, modeling, evaluation, and training of teachers all wrapped up together in one school. The laboratory school is the only enterprise that can bring it off, since it is the natural link between scholars and practitioners in education. We have found that our curriculum development products are far more successful when they are accompanied by training delivered by the developers. When our laboratory school staff members are through with the development and evaluation stages of their work, they have a natural new function as trainers of in-service teachers and ultimately as developers of a cadre of teachers to train others.

To summarize, the laboratory school is the natural point of contact between the schools, the faculty of the college of education, and the faculty of other departments of the university. It can be a locus for training educational personnel in both direct and indirect ways, such as on-the-job experience.

Keeping the Laboratory School Program up to Date: The Dynamics of Laboratory School Change

Finding the niche. Of course, the first task is to find the niche in a particular school's environment. What kinds of service will be performed? The laboratory school's external environment consists of the faculty and administration of the host college and the university generally, including the governing board. Outside the university, we must consider the schools in other service areas, other public instituions, the executive and legislative bodies that influence our functions and our budget, and others.

We must consider present and possible resources and the inevitable pressure on scarce funds. Students, parents, and former students are also a part of our environment. In studying this environment, we must look for types of service that will be seen as distinctive and valuable, that will give the laboratory school identity and support.

Deciding on particular programs. The second and related task is to select the programs that are of greatest value. If the niche is clinical practice in teaching, what theories or models of teaching will be used? The major niche of our school in Hawaii is curriculum development and related teacher training. We are continuing to work in secondary English language arts, revising an earlier program that was too complex and multifaceted for schools to use. We are going to continue to develop materials on the ethnic character of our peoples in the Pacific-Asian area; no one else does this work, so we have a relatively open field. Also, all the groups in our environment will respect this choice.

We see ourselves in the business of "thin market publishing," developing and publishing educational materials that fit our regional interests but do not attract publishers for the national market. We will continue to develop secondary school programs that don't segregate students by "ability" or "need" or "interest," for in our state that means educational segregation by ethnic group and social class. This is not just a local problem; we are working on it because we believe that nonsegregating program models are needed and that schools will adopt them when they are available. In other words, we are willing to take a chance on a model that no one is asking for.

We will work on a number of computer-related projects, though with restraint. This is such an attractive field for educational development that we are worried that it will consume too much staff energy. We are interested in designing school programs that will better serve students in educational or personal distress, including programs in which schools are coordinators and organizers of special services to their studetns and their families. Too often we say that student and family distress is someone else's job. I am hypothesizing that the school may be the best—perhaps the only—organization in the community that can orchestrate these helping services.

We will continue to design currcula and related instructional practices that stress inquiry, problem solving, creativity, and reflection. John Goodlad in his book *A Place Called School* reminds us how drab and unimaginative our school programs

are. We would like to do something about it. There are other targets, but these give a sample of what we have chosen to work on to fill our niche.

There are some topics that we consider not as promising. We are going to do only limited survey or descriptive research. While keeping our environment available for research by college faculty, we will keep it in balance with our primary program. We are not going to be able to do much clinical supervision of teachers, not because it is not important but because our primary definition of service competes with it, and we don't think that we can do everything well. We are not going to put much energy into multimedia or media-based innovations except for computer applications. This effort has not paid off well in the past, and I don't expect it to change. Writing for educational journals is an important part of our role but not our primary function. I can't imagine anyone deciding to give us our budget for fulfilling this function.

Leadership. Leadership is important in the laboratory school, as it is everywhere else; perhaps it is more important because we are not well known or well understood. Leadership must solve the usual functions of program direction, personnel development, finance, and communication, plus the important function of keeping the school visible in important circles within its environment. I've heard it said that universities work on a "star system," with respect and support given to the "stars" on the campus and their departments. If this is true—and it may well be—we want our leaders to have "star" quality.

In our Hawaii laboratory school we have separate leadership for the directly educational functions and the intellectual and developmental functions. Both are important, but both are full-time jobs. Also, some of us are better at one job than others, so we achieve some of the advantages of specialization. This practice leads to problems of cooperation and coordination, but these can be managed by the right leaders.

Staff selection and development. Selecting and developing staff is as important as selecting program emphases. In fact, the two go together in that one selects staff to accomplish one's functions. I have found that it takes the best of our profession to work successfully in laboratory schools. We need intelligent people who are at the same time cooperative, hard-working, and good models for students. The pressures of life in the laboratory school and its environment are demanding and test the inner

character of the staff. Hence we need strong people. In our curriculum research and development work we have found it necessary to have a balance of people who have strength and experience in teaching, people who are strong in their academic disciplines, and people who are strong in the intellectual aspects of education. The mix of these strengths gives us the power we need. The role of another laboratory school may require that it have a different mix of individuals and specialties.

School composition by size, age level, and student background. The composition of the school by size, age level, and student background is an important feature of the laboratory school. Any size larger than absolutely necessary can be a misuse of resources. We reduced the enrollment of the Hawaii laboratory school from 1,200 to 380, thereby saving staff and space for research and development services. Fortunately, the amount of our resources was not based on student enrollment. Laboratory schools vary, from those with preschools only to those with a full range from preschool through high school, and every combination in between. There is more scope and potential with a wider student group, which permits program building and modeling for the longer period of students' life in school. But where resources are limited, a smaller span is usually advisable. Also, one's functions dictate what kinds of students a school needs. There are some arguments for specialization with a limited age group.

My preference is for a broadly composed student body from homes in the full spectrum of ethnic and socioeconomic groups in the city or region. This spectrum gives us the opportunity to experiment with and disseminate educational practices that can reduce segregation in the schools. It also gives our research more validity. For schools that must charge tuition, this feature is more difficult; financial help would be needed to bring in students who do not pay tuition.

Finances. Finding resources for our laboratory schools is one of our most troublesome tasks. We have many patterns of finance within our group, ranging from full state funding to dependence upon tuition payments. Each school must develop its resources within the patterns available to it. There are sources of additional funds, but funding is not easily available. One possibility mentioned earlier is to conserve resources by keeping the school as small as is consistent with one's functions.

Developing constituencies. I noted earlier that laboratory schools seem to be invisible to those who write about improving education. We cannot exist happily or long where this condition exists. A strong relationship with the dean is obviously important. Fortunately, I have had that support from present and previous deans in my institution. One must keep them informed, involve them in planning and reviewing programs, and listen to their ideas and suggestions. Deans must see the laboratory school as an essential part of the college. The larger college faculty is another constituency. In some schools there is a very close relationship in which the college staff uses the school as a research or training instrument. Where the school has functions independent of the faculty, such as self-initiated research and development, the relationship is often neutral or strained. Specialization of interest goes with specialization of work. We can only work at this as best we can, by using the dean to help and by developing cooperative programs or both.

Relationships within the larger university are often more difficult, but they can be positive and successful. It is important to have visibility in the general faculty of the university and with the university administration, but it takes work. It is also helpful to have an understanding with the regents of the university about the school's program. When administrators change, the board can be a balancing agent.

The public and private schools in a region are usually one of the laboratory school's biggest constituencies, especially when curriculum development, in-service training, and other school improvement projects are attempted. It is helpful to have major school administrators speak of your contribution to the schools. This means, of course, that you are doing significant things for the schools—and are being recognized for doing them.

Laboratory schools in public universities are often visible to state legislators and to governors. This is especially true in a small state, but it can occur in our larger states when the continuation of laboratory schools is at issue. This constituency must be built. I consider it legitimate to have a few children of legislators in the school.

Students, former students, and parents are another important constituency of the laboratory school. Many of them are members of key community groups. Their talk with friends and acquaintances helps form the school's reputation. Many of them know administrators, board members, legislators, and state administrators, to whom they pass on their views about the value

of the school. A competent and aggressive program of communication is essential for developing these constituencies.

Conclusion

I have spoken of finding and developing the niche in the university and school environment to which each laboratory school belongs. I believe that we must modify that niche as needed and exploit its potential creatively and aggressively. Finally, I believe that our laboratory schools will survive and prosper if we do the following:

Undertake a very important job that fits a niche.

Be recognized for undertaking this important job.

Do it very well.

Be recognized for doing it very well.

LABORATORY SCHOOLS

An Educational Resource

National Association of
Laboratory Schools

Curriculum Research & Development Group
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Honolulu
1991

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Acknowledgments

EVENTS DURING THE LAST FEW DECADES have altered the course of laboratory schools across the nation. For that reason the directors of the National Association of Laboratory Schools (NALS) decided eight years ago that the time had come to publish a book updating the record and reflecting on the changes—no small task! Members of the NALS board surveyed the schools and sifted data. School directors and staff members assembled historical records, contemplated their own experience, and articulated their ideas in the essays assembled in this volume. Without them we would have no book.

Crayton L. Buck, director of the College Learning Laboratory at Buffalo State College, and Loretta Krause, principal of the University of Hawaii Laboratory School, co-chaired the publication committee. They solicited the essays, nudged their authors, and kept the project on track. The executive director of NALS, John R. Johnson, administrator of the University School at Indiana University of Pennsylvania, served as nerve center and troubleshooter.

The materials were assembled and edited in Hawaii at the Curriculum Research & Development Group (CRDG), of which the University Laboratory School is a part. Arthur R. King, Jr., the director of CRDG, massaged the manuscripts for coherence within the plan for the volume, with help from Ralph Williams, who also put the essays on the word processor. Edith K. Kleinjans, CRDG's house editor, then edited the revised manuscript. Kathleen Berg tracked down vagrant references and tied up other loose ends.

Photos came from collectors at the campus schools of Ball State University, Buffalo State College, Carnegie Mellon University, Eastern Washington University, Florida Atlantic University, Eastern Oregon State College, Hunter College, Indiana University of Pennsylvania, Keene College, and the University of Hawaii. Henry Bennett of Independent Resources handled design, production, and printing of the book.

An extra measure of gratitude goes to three friends of the University of Hawaii Laboratory School for their generosity in helping to underwrite the costs of this book. They are Takayoshi Mizushima of Tokyo, president of the Cultural Foundation on Promoting the National Costume of Japan; Masanori Sugo, principal of the Nishinippon Junior College High School in Yame city; and Kazumasa Okuda, director of the Sohseikan High School in Isahaya city. Mr. Mizushima assists the lab school in its kimono art project. The two schools are "sister schools" of the lab school.

Loretta Krause

Foreword

IT HAS BEEN TWENTY YEARS since C. Robert Blackmon of the University of Southwestern Louisiana assembled *Laboratory Schools, U.S.A.—Studies and Readings*. That volume carried sixteen articles about campus laboratory schools. Among the articles, some treated the schools' search for identity, their status, and their roles in educational research, curriculum development, and the education of teachers. Other articles looked at the past, speculated about the future, and profiled schools that performed oustanding work or departed from the pattern of sponsorship by a college or university.

At that time laboratory schools were under pressure to prove their value to the profession. With a slow job market for teachers, the need for sites for observation, demonstration, participation, and practice teaching had slackened. Research and experimentation were being pushed as promising roles for laboratory schools.

Some states were reviewing their campus schools to determine whether they were worth maintaining. By the mid-seventies, the number of such schools had declined to 166 from over 200 in 1964. By 1982 the number was down to 123.

In the interim from 1970 to 1990 a good many educators—Irving G. Hendrick, Francis S. Chase, John I. Goodlad, William Van Til, and Arthur R. King, Jr., among them—have written about the dilemmas of laboratory schools and advised concentration on experimentation, research and development, or other emerging areas of service. But they have also recognized that without resources the schools could do little. As William Van Til put it, the schools are "exhorted to make bricks yet supplied insufficient straw" (1987, 24).

This volume, prepared by the National Association of Laboratory Schools (NALS), tells what the schools have done about the dearth of straw—and how some have managed to make bricks despite the shortage.

The first chapter, "Laboratory Schools in Times of Change," reviews the responses of campus schools to changes from the time they were adjuncts to training academies, through the mid-century decades of social change, to recent decades of new demands and new challenges. It was written by two administrators, Crayton L. Buck of the College Learning Laboratory at Buffalo State College and Kenneth E. Miller of the Burris Laboratory School at Ball State University.

Chapter 2, "Functions of Laboratory Schools," surveys today's lab schools, showing which of the traditional roles they still fulfill, what newer ones they have taken on, and how they rank each of eight major functions. This chapter was written by Buck and four other lab school people: Robert Hymer, Jacksonville State University of Alabama; Gene McDonald, formerly of Southeastern Louisiana University; Jackson J. Martin, Eastern Washington State University; and Theodore S. Rodgers, University of Hawaii.

"Strategic Planning for Laboratory Schools: Concepts, Models, and Cases," Chapter 3, reports how seven schools have responded to changes and challenges. Ross A. Nielsen draws a "blueprint for laboratory school success" from his many years at Price Laboratory School, University of Northern Iowa. Lynn McCarthy and Albert Bertani of the National College of Education in Evanston, Illinois, offer a step-by-step guide for a self-study as a prerequisite to setting new directions. Then Charles V. Branch, of Metropolitan State College in Denver, recounts how the college and the public school system joined forces to convert a public elementary school into a cooperative laboratory school called Greenlee/Metro Laboratory School. Adrianne Bank explains how and why the elementary school of the University of California at Los Angeles became a "center of inquiry" into three areas of educational need. Buck describes how the College Learning Laboratory in Buffalo came to be a cooperative enterprise of State University College and the Buffalo school system, focusing on pre-service education of teachers. Ann Baldwin Taylor, head of the Children's School at Carnegie Mellon University, tells how her school serves dual roles as a research site for studies of child development and as a field experience site for students who plan to teach preschoolers. Finally, Arthur R. King, Jr., director of the Curriculum Research & Development

Group at the University of Hawaii, relates how the university's laboratory school switched its mission from assisting in teacher preparation to designing, developing, and disseminating curricula.

Chapter 4 compares the features and operations of laboratory schools in the United States and attached schools in Japan. Its authors are King of the University of Hawaii and Yasushi Mizoue of Hiroshima University.

In Chapter 5, "Governance and Financing of Laboratory Schools," Buck and Martin report on how schools share governance with their sponsoring institutions and where they get their financial support.

Chapter 6 showcases thirty-two lab schools that responded to an invitation to send descriptive sketches for inclusion in this volume. The schools are listed alphabetically by state.

"Campus Schools in the United States to 1965," Chapter 7, looks back to the early days. It consists of excerpts from a book in which the late Harry Hutton, of Pennsylvania State University, chronicled the evolution of these schools from the era of training schools and normal schools to the time when state teachers colleges became universities with colleges of education. Hutton's theme is the schools' slowness to respond to the imperative to experiment, research, and innovate—a theme that recurs in nearly every study of laboratory schools.

In the final chapter, eight lab school people pool their speculations about the future, posing answers to questions about niches for the schools, their relation to universities and school systems, and the conditions that lead to success or failure. The authors are Buck, King, and six others: Mina Bayne of the University of Wyoming, Roy Creek of the University of Pittsburgh, Judith Hechtman and John R. Johnson of Indiana University of Pennsylvania, Bart Tosto of Buffalo State College, and Gregory R. Ulm of Indiana State University. They predict that the innovative and competent among university-based schools will succeed to the degree that they respond creatively to the nationwide demand for educational improvement.

3

Strategic Planning for Laboratory Schools: Concepts, Models, and Cases

THIS CHAPTER TELLS ABOUT THE FORMING of laboratory schools, giving their "creation stories"—or, more properly, their "re-creation stories," since their new designs were built upon older ones. We begin the chapter with an overview of laboratory school planning concepts to set the context for the stories that follow.

As a class, laboratory schools were created during a period of nationwide interest in and support of the idea that some schools were needed as sites for testing, demonstrating, or disseminating instructional innovations. Each lab school, however, has its own history of responding to the context of its sponsoring college, its locality, and its political climate. The accounts of seven schools, told by leaders heavily involved in their development, reveal common experiences in the re-creation of these schools. Ross A. Nielsen presents his account in the form of a blueprint for laboratory school development; Lynn McCarthy and Albert Bertani relate the generalized experience of two laboratory school leaders; Charles V. Branch, Adrianne Bank, Crayton L. Buck, Ann Baldwin Taylor, and Arthur R. King, Jr., analyze strategic planning as it evolved in their schools.

Strategic planning can be defined as "the effort to think creatively and systematically about planning for an organization, with

emphasis on both internal factors and the external context of the institution." We believe that the stories related here can yield insight into the process of planning not only for laboratory schools but also for other schools related to university programs, such as professional development schools.

LABORATORY SCHOOL PLANNING CONCEPTS

The Niche

The niche, or slot, of the laboratory school in its larger institutional context is always of prime importance. A series of questions typify this element in planning: What is the laboratory school to do? Why will it do it? How will it do it? What alternatives must be considered? Is this type of service distinctive and necessary? Can the school do it well? Can the school get recognition for doing it well? Can it develop the support it needs? Who are its constituents?

The organizational base, usually in a college or university, often in a school system, sometimes in a partnership, is important. Will the base provide legitimacy? Support? Flexibility? Freedom? Resources?

The function and the organizational base help the school build a constituency and develop a set of connections. Among potential constituents are university colleagues in education and other knowledge fields, college and university administrators, local school systems, parents and students, teacher trainees past and present, legislators, businesses, professional organizations, funding bodies, and other organizations in the community with a stake in education.

The Resources

Resources make or break all programs, and laboratory schools almost universally have severe resource problems. A solid and predictable financial base makes possible the development of staff and the allocation of staff time to important teaching and nonteaching tasks, including research, publication, travel, conferencing, and other forms of networking.

The adequacy and appropriateness of staff is a prime concern of all laboratory school planners. Leaders must handle the usual functions of program direction, personnel development, finance, and communication, plus the important function of keeping the school visible in important circles in its environment.

Staff must be strong as teachers, and more. They often serve as researchers, writers, editors, teacher trainers, workshop leaders, and administrators of sections and projects.

Plant and equipment are important, too, although many schools prosper in spite of minimal, even substandard, plants and equipment.

Students

The types and numbers of students are crucial parts of the strategic plan. Students have been selected for lab schools by certain criteria, among them such specific features as age, handicap, ethnicity, giftedness, income, or socioeconomic class—and sometimes by ability and willingness to pay the costs. The types and numbers of students served often influence the financial health of the school. Students and their parents must accept the special mission of the school and the requirements imposed on them by that mission—experimentation, clinical teaching, demonstration, or other mission.

The strategic plan is a creative balance of these elements. The process of developing the plan is an interesting and important one, particular to the situation and the persons participating. In this chapter we illuminate the process.

DASH to all school districts in the Monongahela Valley. The school has received a grant from the National Program for Mathematics and Science (the Eisenhower program) to serve the larger urban industrialized area in the valley and beyond. The staff will produce supplementary materials, including an administrator's handbook and a family newsletter, for use throughout the area.

A LABORATORY SCHOOL AS A CENTER FOR DEVELOPMENTAL RESEARCH

Arthur R. King, Jr.
University of Hawaii
Honolulu, Hawaii

The Present Organization, Mission, and Functions of the School

The University Laboratory School is on the main campus of the University of Hawaii. Its 340 students, ranging from kindergarten through grade 12, constitute a planned sample of the students of the state except handicapped students. Students are selected to represent the ethnic, socioeconomic, and measured I.Q. diversity of youngsters in the state. Among them are part–Hawaiian, Japanese, Caucasian, Chinese, Samoan, Filipino, Korean, Afro–American, and mixed-race children from Hawaii's multicultural population, as well as some students from Oriental and Pacific Basin cultures. Families represent professional, semiprofessional, clerical, technical, skilled, and unskilled workers, along with unemployed ones.

An essential feature of the school is its role as an integral part of the Curriculum Research & Development Group (CRDG). The Lab School, as it is commonly called, shares a common mission, site, staff, and commitment to the improvement of education through a set of related activities that include research into curriculum and instruction, design and development of curricula, teaching services to students and families, demonstrating, publishing, in-service education, and evaluation.

The school is almost completely supported by the University of Hawaii as part of its organized research program, making the CRDG/Lab School equivalent in university support to organized research units in engineering, astronomy, social science, medicine, agriculture, and other fields. Funds are appropriated by the state legislature. Minor additional funds come from the federal school lunch program and some federal funds generally available to independent schools.

The CRDG and the laboratory school are organized under the college of education. Although budget and staff are not mixed with those of the college, CRDG staff members make important contributions to the college's instructional programs by teaching undergraduate and graduate courses and supervising graduate student research. The CRDG/Lab School staff participates fully in faculty governance of the college and the university. The lab school is a "public school" in charging no tuition and in following the general mission and form of public schools. The state educational agency has no control over its program but does certify its teachers under the flexible regulations used for independent schools in the state.

The school serves as a site for idea generation and as a field base for the research and development functions of the CRDG. Daily interactions with students and families in the school context are an essential source of questions, criticisms, ideas, and hypotheses. The school also serves as the site for the first stages in the development and evaluation of programs that make up the primary output of the CRDG/Lab School. Program ideas are often developed by staff members who both teach students and serve on curriculum projects. The large, comprehensive staff numbers almost ninety.

Changes made in the school since 1966 have enabled it to assume its research and development role. Its functions have become more firmly defined into six main categories, providing

- an optimal setting for organized large-scale curriculum research, development, and evaluation.
- a stimulating environment for low-cost explorations of promising curriculum development ideas.

- a demonstration site for working curriculum models of various kinds, open to visitors from Hawaii and elsewhere.
- a site for undergraduate and graduate student research.
- a place for curriculum dialogue, teacher in-service training, seminars, and conferences.
- a quality education program for all students enrolled.

The R&D program focuses on developmental research related to the curriculum and instructional programs of the schools, along with evaluative research on school programs.

Curriculum Research—Our research encompasses the nature, problems, and possibilities of

- the school subject areas (art, drama, science, Hawaiian studies, music, marine studies, ethnic studies, English language and literature, Japanese language and culture, and mathematics, among others).
- educational topics of concern (gifted children, teacher in-service education, at-risk students, curriculum design, educational evaluation, and curriculum development in multinational settings, among others).

Curriculum Development—Our development activity has yielded a number of educational programs in wide use in this state and in several locations on the mainland United States and abroad. Among them are these:

- literature of Asian and Pacific peoples
- history of modern Hawaii
- music for elementary schools
- marine science for high schools
- composition and grammar
- language and linguistics
- computer-related education
- science for intermediate grades
- nature study for elementary schools
- nutrition for people of Hawaii and other Pacific islands
- coastal zone management
- Japanese language and culture
- science, health, and technology for elementary schools

- algebra and geometry for high schools
- ethics

The typical finished product of the curriculum research and development process consists of the following:

- a general theory of the knowledge base, including its conceptual and inquiry elements (mathematics, science, linguistics, writing, history, or other)
- a theory of instruction that accounts for various learning styles and paces of learning
- a theory of teaching
- a set of student materials
- a teacher's manual
- support materials (books, maps, reference pamphlets, activities for students, and aids to evaluation)
- a course for teacher training
- a system of publication, dissemination, and training

Record of Use—Some six hundred CRDG publications are in use. As many as 90 percent of eligible students in Hawaii use one or more of our courses. There is growing interest in some of the programs on the U.S. mainland and in several foreign countries (Japan, Australia, New Zealand, Israel, and Canada). About twelve hundred schools use Foundational Approaches in Science Teaching (FAST), the CRDG intermediate school science program.

Other Contributions—The CRDG staff is continually serving the projects, studies, and other research and school-improvement needs of the Hawaii school system. The staff is heavily involved in the academic programs of the college of education and of other colleges, serving as teachers, visiting specialists, demonstrators of instructional practice, and research advisers.

The Curriculum of the Laboratory School as an Experiment—The curriculum of the school is itself a major experiment. From kindergarten through grade 12, students participate in a common sequential curriculum and a rich program of extracurricular activities. Students are not grouped or tracked by "ability" or past performance except in the final two years of high school mathematics. One of the

main purposes of this design is to eliminate in-school segregation of students and to give equal access to knowledge for all. In science, all students take a sequence of studies ending in chemistry and physics. All students enroll in three years of a foreign language—French, Japanese, or Hawaiian. All students enroll in both art and music each year, as well as physical education, social studies, and mathematics. All students are kept together in mathematics through grade 10; they have different though rigorous studies in mathematics in the eleventh and twelfth years. Full participation in extracurricular activities is urged. Over 70 percent of the boys and 60 percent of the girls participate in one or more interschool athletic programs; there is wide participation in drama.

Key Elements in the Planning/Developing Process

In the early 1960s, the three independent laboratory schools at the University of Hawaii (preschool/primary, elementary, and secondary) went through a crisis. Their traditional primary function as a site for practice teaching was considered by many to be expendable because most teachers were performing practice teaching in public schools. In addition, several externally funded experimental programs in teacher education had been conducted successfully in public schools. The students in the laboratory schools were drawn largely from faculty families and other professional and business families—a practice that undermined the school's credibility in a state committed to quality education for its lower-income, culturally different children.

The school faculties and Dean Hubert V. Everly of the college of education had committed themselves to a shift from clinical teaching practice to educational research. In 1964, Dr. David Ryans, head of the research unit of the college, solicited the views of leaders in educational research from major universities (a *Who's Who* of educational researchers of the time) on the possible roles of laboratory schools in educational research.

The issue of the schools' future was brought to a head in a formal study of their functions in 1965, conducted as a part of the extensive study of the college program. The study director was Dean Lindley J. Stiles, a respected national leader in educational research, who submitted his recommendations to the president of the university, its board of regents, and the Hawaii legislature.

The study recommended that the three schools be consolidated and that the university

> change the role and functions of the Laboratory Schools from that of demonstration and teacher training for prospective teachers to one of research and innovations [particularly of the developmental type] to improve schools and teachers in service. This action . . . is logical and needed if the Schools are to continue to justify their existence. . . . The paramount criterion should be the impact made by the Schools on the quality of education throughout the State of Hawaii. (Stiles 1966, 58–60)

The national educational agenda of the mid-1960s set the tone for the recommendation. Educational reform was part of President Johnson's "Great Society" program. The national cooperative research program had become part of the experience of university programs in education. Further, the "big project" development programs in science, mathematics, and social sciences were in full swing. The idea of university cooperation with the schools in educational improvement was encouraged.

I was appointed director of the newly consolidated school, now called the University Laboratory School. I had only recently come to Hawaii, bringing a background in teacher education, curriculum theory and design, educational administration, and cultural foundations of education. A single principal was appointed to operate the school; the director, principal, and staff, in cooperation with their colleagues from Hawaii's department of education (Hawaii has a single statewide school system) set about developing the new program focus and reshaping the school to carry it out.

The initial vision of the research role of the school was quite general, noting the promise of cooperating with the public schools and engaging in curriculum development. One desired role of the school was that of an environment for research by regular college staff, with the lab school staff providing assistance.

Then assistance appeared from an unexpected quarter. The state had received a large, continuing grant from Title III (educational innovation) of the Elementary and Secondary Education Act. It was

discovered quite accidentally, at an informal coffee session after a meeting of a professional organization, that the new Title III program and the emerging laboratory school program were natural partners in school development. A Department of Education/University of Hawaii joint venture called the Hawaii Curriculum Center was started in 1966.

The new joint mission and the new resources gave a great stimulus to the emerging work agenda. The shift in efforts drew great visibility, including some tension and criticism, along with major support from the school department, the college, the state legislature, and public groups interested in education. After extensive study of the new joint organization and its programs by the legislature, the decision was made to keep the functions but to alleviate tensions by terminating the joint administration of the program, assigning control of each segment to its sponsor, the state education department or the university. The department's Title III program and the university's program were administratively separated, though considerable cooperation, including common housing, was maintained. A joint agreement approved between the two agencies in 1969 has governed the relationship for over twenty years. The university's part of the venture, including the laboratory school, became the Curriculum Research & Development Group.

Responses to the New Design

Staff—Within three years, over 80 percent of the original school staff (called "supervisors" of practice teachers under the previous model) left to take positions in the teacher education program of the college or in the public schools.

The remaining staff members were offered released time and encouraged to prepare for new roles as teacher/researchers, but only a few did. Replacements were recruited among people interested in careers in research and development. They ranged from beginning teachers to holders of doctorates.

The school had three principals before Dr. Loretta Krause, a lab school teacher with a new doctorate in educational administration, took over in 1971. She has been a major mover in developing the innovative programs of the school and its support to the R&D function. The pattern of separate staffs for school operations and R&D operations gradually gave way to a mixture of functions for all. Leaders were

added for major curriculum areas and for evaluation. A new system for classifying and upgrading staff eventually yielded a staff of whom more than half enrolled in or completed doctoral programs. Staff continuity of experienced people has been remarkable.

Students in the School—After it was decided that the new functions did not require as many students, their number in the original three schools was reduced from 1,200 to 365 through attrition. Because the university continued its allocation of fifty regular faculty positions, resources were available to serve the new functions. New students were drawn to mirror the state's population. The new policy helped to validate the school's students as typifying all children in the state, and it gave the school the opportunity to experiment with changes in curricula and organizational patterns and processes for more typical students.

Constituents for the School—The changed functions also changed the constituency of the school. New, productive, and highly supportive relationships were made with

- faculty members in the arts and sciences and professional colleges of the university, who welcomed the opportunity to participate in influencing the curriculum of the school through an organized, systematic approach.
- the public school system of the state, which welcomed a partner in the school renewal program.
- policy makers on the board of education, the board of regents, the legislature, and active community groups, who saw the potential for aiding in improvement of school programs.
- schools in the university's service area, in Pacific Island territories, and, more recently, on the U.S. mainland.
- the funding source noted below.

One group of former constituents of the school was unfortunately lost: the faculty of the college of education, who regretted losing the school's commitment to teacher training and rarely identified with or participated in the new R&D programs.

Funding the Program—The fifty professional positions from the university give a stable base for the programs of the CRDG/Laboratory School. Reducing the student population made resources available for

building a career staff capable of serving the combined functions of curriculum review, design, development, evaluation, dissemination, and support to schools. This basic resource has been augmented by funds from federal programs—the National Science Foundation, the National Diffusion Network, the Department of Education—and from the state's education department and other state agencies in Hawaii and elsewhere. Dissemination of CRDG programs to the U.S. mainland and elsewhere, the sale of educational materials, and provision of teacher training have extended the outreach of the CRDG.

The CRDG has a revolving account with the Research Corporation of the University of Hawaii, which handles its funds for publication and in-service training and its inventory of educational materials worth a half million dollars. We have learned that stable funding is essential to sustain an R&D program. Grants and contracts can augment but not supplant the funding base.

Unanticipated Developments and Program Modifications

Although our commitment to the improvement of schooling remains firm, our programs have continually developed and changed. We noted earlier the reduction in the number of students, the change in the composition of the student body, and the relationships established with the Hawaii Department of Education and with constituent groups and organizations. The CRDG has taken on other roles as we learned through experience what it takes to help schools change.

At first we had only a vague notion of the quantity and kinds of support required to buttress curriculum innovation—in-service training, publishing, evaluating, and networking with others in our profession. We have gained insight into the amount of care needed to support each phase in the change process and each institution joining the effort to improve curriculum. We learned to expect little from the publishing and marketing industry for small innovative curricula. We learned to avoid the host of clichés that dominate contemporary educational change. We learned to continually reinterpret our mission and to reprogram ourselves in response to our supporting university, to our other constituencies, and to political forces that can help or hinder us. We learned early why a laboratory school cannot do many functions well at the same time. Hence we do little clinical training.

Developments in the late 1970s and early 1980s have aligned the CRDG and the lab school with schools and universities in Australia, Canada, Japan, and New Zealand to improve knowledge about Pacific peoples and countries in our schools.

More recently we have established cooperative links with other laboratory schools and their supporting universities in developing and disseminating a new elementary curriculum in science, technology, and health.

Future Changes

We believe that our basic programs and approaches are sound. We will expand our set of curricula in music, art, science, math, and social studies. We are revising our secondary program in English language arts. We are investing in a larger set of strategies for educational change. For example, we are working with schools on a scheme for giving teams of teachers authority and responsibility for the school success of assigned clusters of students. The teachers plan the instructional program, monitor the progress and behavior of students, counsel them, and stay in touch with their families.

We have neglected to record and report the insights we have gained in our work; hence we will expand our writing and publishing program. We are considering boosting elementary and middle-school enrollments for projects focusing on those levels. The program in preschool education awaits better definition.

A Final Word on Strategic Planning

Campus laboratory schools are among the less visible landmarks on the education scene. A recent writer has even referred to them as "former university laboratory schools," apparently assuming that they have slipped away into history. In fact, there are over two hundred active, productive laboratory schools in existence today. About half of them serve the elementary and secondary sectors of education; the other half are early education centers serving child-study needs of

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Donald van Deventer, Ph.D. | Jeff Dinkmore | [illegible] Ph.D.

WHAT LIES AHEAD

PREDICTING THE FUTURE

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Botox Reinvented
Volcano Prophecy
The Best New Handhelds
Russian Math in Hawaii
Easy Summer Style
Kakaako's Urban Renewal
Great Expectations for Men
The World's Worst Hotel

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Russia is renowned for linking math concepts to real-world situations, creating a context of understanding with an emphasis on critical thinking and problem solving. An innovative mathematics curriculum in Hawaii, called Measure Up, is adapting this Russian ideology for first and second graders. Students in this new program are raising the academic standard and excelling in algebraic concepts and skills, writes Nicole T. Boynton.

deep impact:

measure up math

Mathematics instruction in the U.S. is dominated by memorization and drill, despite a growing consensus that these approaches are ineffective. In contrast, "Russian students don't cite rules for solving math problems; they understand them — correcting their errors through conceptual understanding," says Jean Schmittau, associate professor of education in the School of Education and Human Development at Binghamton State University of New York.

Measure Up is based on the preliminary work of psychologists, educators and mathematicians in Krasnoyarsk, Russia, who were discouraged by low test scores during the 1950s. Instead of merely repackaging the same math, the researchers adapted a theory originally conceived in the 1930s by developmental psychologist Lev Vygotsky and V. V. Davydov, vice president of the Russian Academy of Education and head of the Russian Institute for General and Pedagogical Psychology. Initially banned by Stalin, the Vygotskian method is now used in 10 percent of the schools in Russia.

Research has shown that Russian students taught by this method have a profound grasp of mathematical structure, as well as the confidence and ability to extend their knowledge beyond instruction. Russian children with only three years of schooling are at a level comparable to high school and college students in the U.S.

COLD WAR AFTERMATH

Russia's launch of Sputnik I on October 4, 1957 caught the world off guard, marking the dawn of the Space Age and the beginning of the technological race between the two superpowers. In response, U.S. lawmakers legislated more federal dollars for math and science to be taught in the nation's schools — creating the impetus of the "New Math" movement.

By 1959, at the Royaumont Seminar (sponsored by the Organization for European Economic Cooperation), delegates gathered to discuss the formulation of a revolutionary curriculum to change the precepts of mathematics being taught in the West. The chief result

of the seminar was the expansion of a U.S.-based New Math model to Western Europe — abandoning traditional, Euclidian geometry in favor of German-based "motion" geometry.

It seemed Sputnik divided the mathematical cosmos into two camps — Western and Eastern — reinforcing the escalating Cold War. According to Schmittau, "Russia was insulated under communism, they never went the way of New Math."

Barbara Dougherty, Ph.D., director of mathematics for the Curriculum Research & Development Group (CRDG) at the University of Hawaii Education Laboratory School and the mastermind behind Measure Up, explains the criticism of the New Math movement, "If you look at the textbooks there are a lot of repetitive themes — what is taught in grade three will be taught again in grade four and reviewed again in grade six — instead of figuring out ways of combining or connecting concepts."

Dougherty points to another drawback of New Math: poor execution, a disconnect between the mathematicians who developed the curriculum and the teachers who were working with children. She says, "When the New Math era started everyone thought that it would be a panacea. People who jumped on that bandwagon didn't think about all the ramifications of the program."

There is no question that math scores in the U.S. have lagged behind other developed nations. A recent UNICEF study compared the educational systems in the world's richest countries, testing 14- and 15-year-olds in literacy, math and science. The results: South Korea and Japan ranked highest, while the U.S. placed 18th out of 24 nations. In the annual Brown Center "Report on American Education: 2000," Tom Loveless reports that national and state testing programs show declines in math scores after the fourth grade, extending through high school. The middle-grade slump also appears on the most prominent international test, Trends in International Mathematics and Science Study (TIMSS).

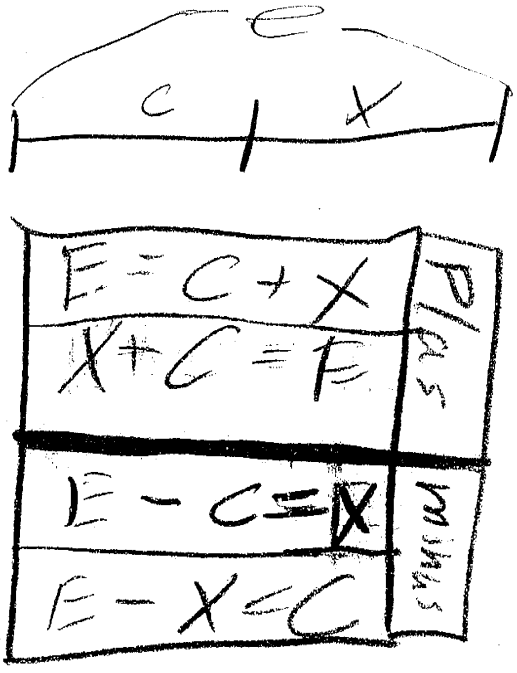
BILATERAL RELATIONS

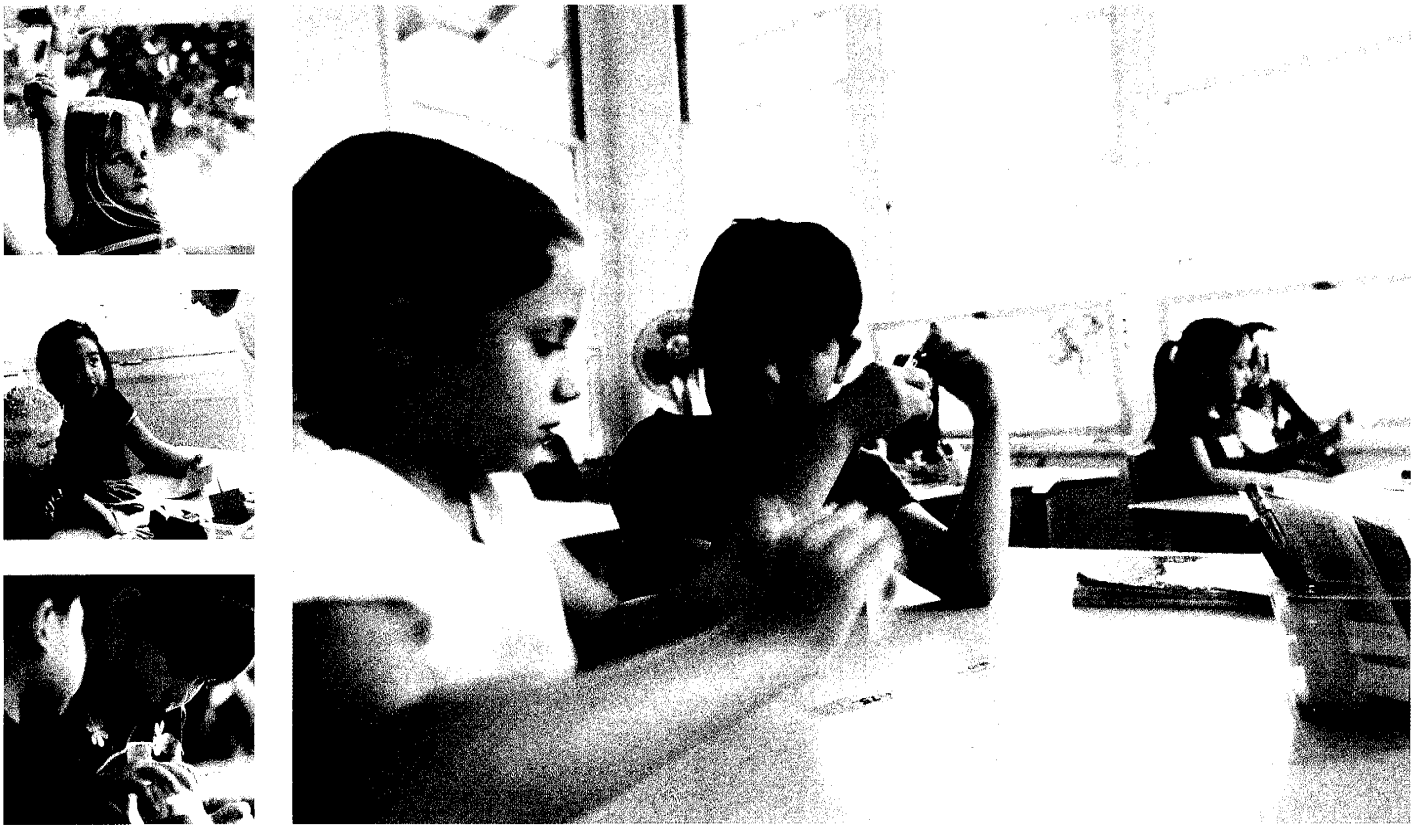
Small pockets of research on the Vygotskian method have occurred across the U.S. Schmittau recently completed a three-year study, translating and teaching the Russian program to schools in the Northeast. According to Schmittau, the study demonstrates that the original Russian materials are teachable. "The program is so well-designed, one can see how concepts that are used in the first grade are used in higher math. Even though the material becomes considerably more difficult in higher grade levels, the children find it easier to learn. By the third grade, they were already solving problems found in high school textbooks."

Dougherty was skeptical when first approached by Russian mathematician Isak Froumin in 1999. "This is not a program we would have started on our own. I remember going home and telling my husband, 'Wait until you see this program because there is no way this is for first graders; this must be for gifted Russian students.'"

Despite her skepticism, Dougherty began an eighteen-month review of the research, and initiated the project with first graders in the 2001 school year. Rather than implementing the translated Russian text directly to the classroom, "We've taken their materials and created a more contemporary curriculum," says Dougherty. "Because when the Russians first developed this they were working with seven- and eight-year-olds, and, in some cases, we are working with five-year-olds."

The UH lab school on the Manoa campus is ideal for documenting case studies on individual children — from kindergarten through grade twelve. Dougherty says, "The school allows the research to be very





"These are not special kids. The research pool is heterogeneous, and there is no grouping within the group. Connections, a public charter school in Hilo, has students of just about every ethnicity, socioeconomic background, and a large number of special needs students."

concentrated and cohesive because you are in control of all the variables." Applicants are selected every year, not by grades or ability, but by their diversity. In fact, the student population reflects the geographic, cultural and ethnic diversity of the state's population. Dougherty makes the important distinction that "these are not special kids. The research pool is heterogeneous, and there is no grouping within the group. Connections, a public charter school in Hilo, has students of just about every ethnicity, socioeconomic background, and a large number of special needs students." Materials developed in the lab school are currently being used in 42 states and 6 foreign countries.

THE INTELLIGENTSIA

Imagine a math class where first and second graders welcome their homework assignments, look forward to their lessons and eagerly raise their hands to discuss problems in front of the class. A second grade student scribbles "I love math" in her notebook, while another student congratulates his partner for a job well done.

Confidence and pride are by-products of Measure Up — encouraged through reading, writing, speaking, critical thinking, and use of multiple representations (using a variety of tools, models and techniques).

The cornerstone of the Measure Up program is language and communication, both written and oral. Students take an active role in the classroom by presenting the methods they use to solve problems, writing corresponding equations on the board, taking notes and asking questions. The students, rather than the teacher, intervene to help solve problems and analyze each other's work. "The teacher really takes a backseat. The students are held accountable.

They are asked to be sophisticated speakers," explains Dougherty.

First graders begin the school year by doing what comes naturally at that age: comparing and measuring objects around them — bottles, glasses and cups, and scales of different types. The students learn what can be compared, like two pens or pencils, and, how, by measuring for length and height. They learn the basic concept of "greater and less than." They learn about area by comparing two pieces of paper of different shapes or the bottoms of containers, as well as about volume, by comparing containers with different amounts of water or rice.

By the third week, first grade students are asked to explain what they are comparing, and eventually a student will suggest writing sentences (such as, the area of the table is greater than the area of the door), then progress to assigning symbols. According to Dougherty, "They actually come up with the shorthand on their own — what Q represents, and that the area of Q is greater than the area of P." Using the physical representation of area, mass or volume, first graders create their own story problems and corresponding statements.

"The surprising thing is that many people believe that if you don't attach a number to it, kids won't be able to get it, because most children begin school by learning to count," Dougherty elaborates. "We thought they would be bothered by having all these symbols. Not a bit, especially because it is related directly to a physical representation."

The first graders learn how to make two quantities they are comparing the same, by adding something to one side of the equation or taking away something from the other (the basis for addition and subtraction). Dougherty adds, "The really neat part is getting at the underlying understanding of addition and subtraction, it helps them understand these symbols."

Confidence and pride are by-products of Measure Up — encouraged through reading, writing, speaking, critical thinking, and multiple representations (using a variety of tools, models and techniques).

Because the program is language-based, students are also taught correct mathematical terminology. Dougherty says, "They learn the vocabulary: that you can write T=Q or Q=T by using the symmetric property of equality; and they are comfortable calling it that."

Numbers are introduced halfway through the first grade. A number line helps students visualize numbers and understand that in order to compare, the units they are comparing need to be consistent. Creating a number line with a spring scale — using either 50, 100 or 200 gram weights — students begin using proportional reasoning to deduce that it takes two 50 units to make a single 100 unit.

Measure Up also emphasizes concurrent representation. Dougherty explains, "In a more conventional math program, kids will learn today's lesson but they can't understand how that's connected to tomorrow's lesson or how one chapter is related to the next. Here it is seamless, because they constantly use measurement. In grade three they will still be using what they learned in grade one." One benefit is that because the students aren't working with isolated concepts, there is residual learning and connectivity.

Dougherty illustrates, "When second grade students are asked what addition or subtraction means, they will explore all these different scenarios about how you might use it. And some students, even in grade two, will go back to these early concepts that the whole is divided into parts. That is very sophisticated: to be able to look at the components of part/whole relationships and abstract equations. They are thinking about the structural relationship of the different numbers with addition and subtraction." The second grade students develop six to eight sound mathematical strategies for adding and subtracting.

The second graders also begin working with base numbers, eventually working up to a base-20 system. Furthermore, the second graders learn to categorize and solve algebraic equations. For example, students learn inverse operations and are able to write a fact team of related statements using three symbols, x, 4 and 7, to create the following equations: $x + 4 = 7$, $4 + x = 7$, $7 - x = 4$ and $7 - 4 = x$.

POTENT FORCE

"The aim of the Russian program goes beyond the mathematical development of these students, it is ultimately targeted to their cognitive development," says Schmittau.

Measure Up students are already showing a more sophisticated understanding of mathematical concepts compared to their peers: for example, no review has been necessary after each semester. Dougherty remarks, "In our program, by the middle of the first week of review, the kids come in asking 'We've already done this, let's do something new.'" In addition, Dougherty believes the students accept the higher math concepts as normal. "You don't get 'It's too hard' or 'I don't know what to do' because it is a natural part of the way they began mathematics."

While interviewing students about equality, Dougherty asked, "How would you explain to a kindergartner what the equal sign is? After the first-graders finished rolling their eyes, they answered in these exact words, 'that the quantities on both sides of the equal sign are the same amount.' When we ask children who have not been in a program...they tell us, 'this means that you have to find an answer.' So it's really a different depth of understanding."

With hours of evaluation and a team of three researchers in each class, the Measure Up team is documenting the students' performance to identify critical moments of learning. After the research phase, the results will be aligned with instruction for further development. CRDG implements a shadow technique to stay ahead of the other two schools involved in the project: Connections in Hilo and the University of Krasnoyarsk in Siberia, a development site in Russia, interested in the new research. "We create the lessons

With a masters from the University of Missouri, **Barbara Dougherty** began her career in special education. She became a math professor by serendipity. While taking summer courses, a math professor encouraged her to enter a graduate program in mathematics. She says, "I don't know what that professor saw in me, but every time I see him, I thank him. It's just awesome to help these kids really get it."

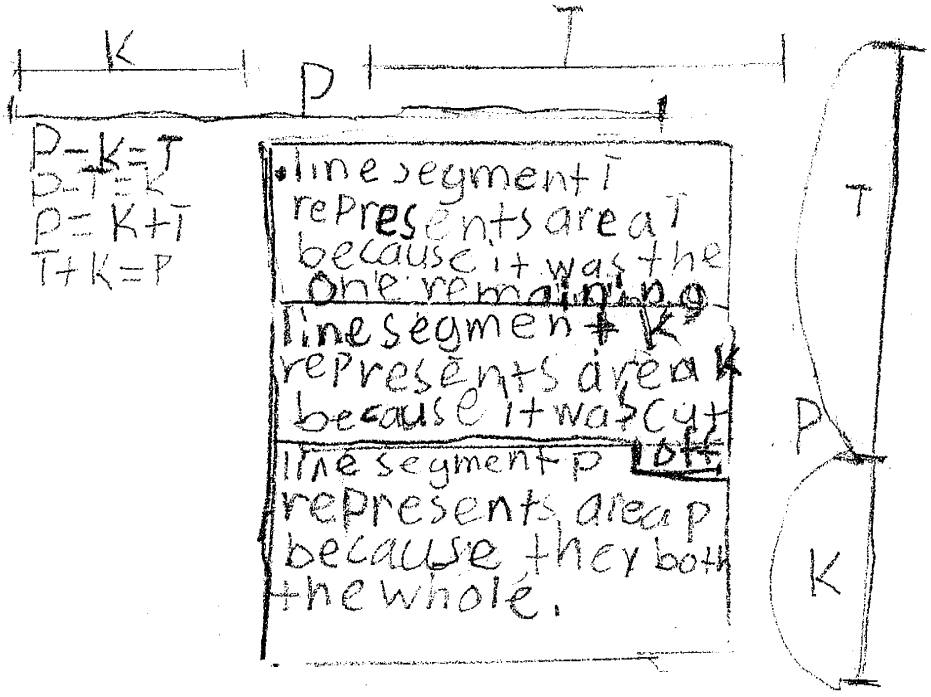
and implement them in our classroom with the research teams, then revise them. After Hilo gives us their feedback, they are revised again before they go to Russia," says Dougherty.

Measure Up is currently recruiting schools to begin pilot studies for 2004. "We have three sites on the mainland with different demographics: Chicago, Atlanta and New Jersey." The team also plans to conduct extensive field testing in 2005 and 2006.

Measure Up materials will be available in about five years, including a compendium of research articles, student materials (textbooks and educational videos), a Web site and CD for parents, and eventually a teachers' component. The parents of Measure Up students are strong advocates of the program; many are members of a volunteer group that will help author materials due out later this year. Although Schmittau already has the English translation of the Russian materials, she emphasizes that teachers need to be trained before implementing the program in the classroom.

According to Dougherty, "We have prophesied that by the end of grade six, the children in this program will have completed a rigorous algebra course." The elementary students in Russia take high school-level geometry and higher-level algebra.

"Students develop a strong understanding of equations: x – 500 = 400 isn't anything more than quantity Q – quantity P = quantity T. Because students have that background, it's a piece of cake. The thing that has been powerfully predominant in this work is that these children can do it. And the parents are just ecstatic."



REVOLUTIONARY CHANGE

The Russian math program is currently available for school districts in the U.S. "We don't have to reinvent the wheel; it is already there," according to Schmittau. Yet Dougherty acknowledges that it will be difficult to convince math curriculum directors to accept the nontraditional approach of the program. "While we can show that children are achieving off the charts, it will be a challenge to create materials that will be palatable for school districts to look at."

In the meantime, Measure Up is attracting worldwide attention: CRDG recently partnered with Ngee Ann Polytechnic, a public university in Singapore, to develop an introductory engineering mathematics course based on a curriculum created by CRDG, entitled Algebra I: A Process Approach. Ngee Ann selected the program to lead students to a deeper understanding of mathematics emphasizing problem-solving and communication strategies. The final product will be available for release in July 2004.

The Measure Up program is currently funded by grants from the National Science Foundation to study gender equity and diversity, such as examining how girls respond to a curriculum that is spatial- and discourse-based, as well as covering travel expenses to Russia to meet the original developers. Measure Up is also partnering with Pacific Resources for Education and Learning, recipients of a No Child Left Behind grant for teachers' professional development and a grant to develop instructional materials with a technology component.

Due to the program's success, the Measure Up team is moving forward with a capital campaign to raise the anticipated $12 million required to expand the program. Dougherty surmises, "We believe if we can make this work, it is going to completely revolutionize mathematics education for young children." <<

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THE LIGHT OF KNOWLEDGE

University of Hawai'i
Volume 18, Number 3
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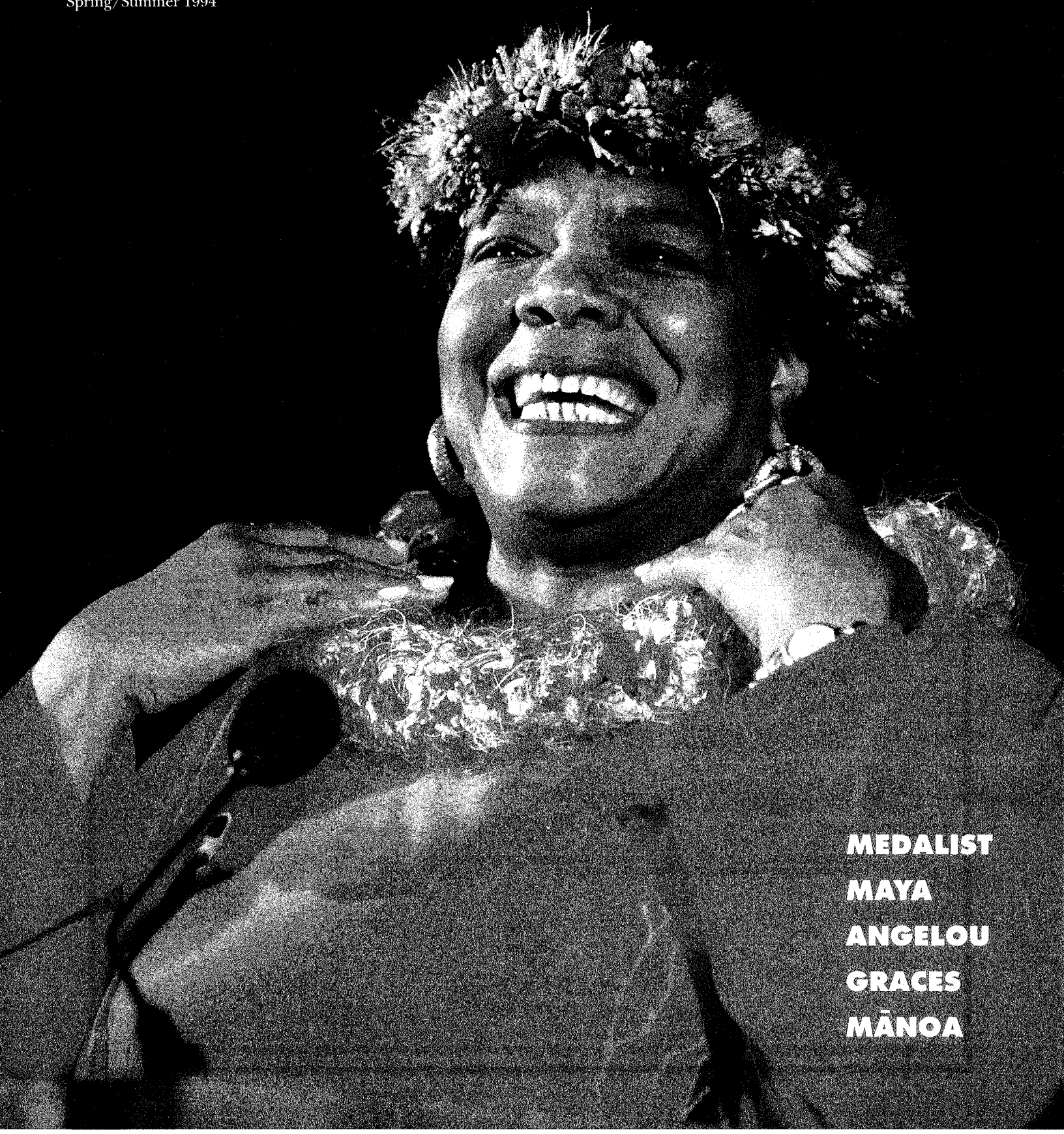
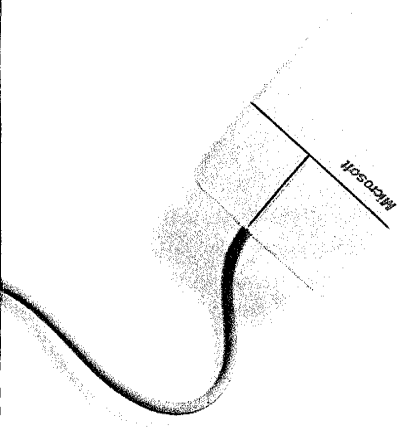


MEDALIST MAYA ANGELOU GRACES MĀNOA

Perfecting School Curriculum



The University Lab School plays a crucial role in university efforts to develop curriculum for Hawai'i and the world

by Pam Nakaso

A hands-on science program is just one of the many K-12 curricula developed at UH and used throughout Hawai'i and across the nation.

Students from Morocco, Russia, Slovakia and Hawai'i recently tapped into the computer at the Manoa campus to contribute to a report on acid rain. Their data will be used to create a world map for comparing acid rainfall, explains University Laboratory School teacher Mary Gullickson-Morfitt.

"By observing, collecting and analyzing the data, children learn how science really works," says Arthur King, director of the Curriculum Research and Development Group (CRDG).

The lab school, with 350 children in kindergarten through grade 12, is a division of CRDG within the UH Manoa College of Education.

Learning how to travel the "information highway" is one of many exciting lessons for the school's science students. They communicate via computer linkup with other students in Hawai'i, mainland states and other countries, sharing data they have collected on environmental topics such as weather patterns, acid rain, soil analysis and ocean pollution.

CRDG's influence extends much further, however, touching virtually every student in Hawai'i and millions in school systems around the world.

Seedbed and proving ground for many educational innovations, the lab school is the primary test site for new educational programs, including curriculum development, educational research, experimentation and evaluation. CRDG hosts more than 2,000 Hawai'i teachers in development activities each year. Educators and others involved in large-scale curriculum and staff development projects or interested in exploring promising curriculum ideas also work with CRDG staff.

Two decades of such collaboration have resulted in many new teaching strategies and curricula, including the award-winning and enormously successful FAST and DASH science programs (see related story).

Marine science studies offers a good example of how a new teaching method or program emerges at the lab school. Loretta Krause, lab school administrator, remembers: "During the mid-'70s the science department

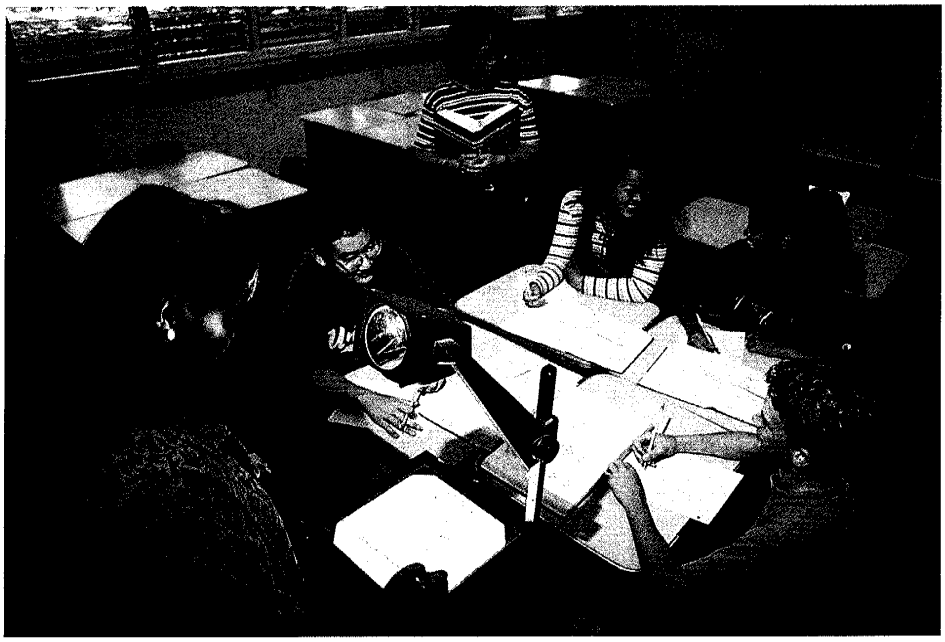
staff thought it was a shame that here, in the middle of the Pacific, teachers were using land-based science materials. One teacher took a small group of students and established the class to test materials for a new marine science curriculum." Now almost all teachers of marine science in Hawai'i, and another 1,000 in 30 other states, use the Hawai'i Marine Science Studies program for secondary school. The curriculum, praised by the National Science Teachers Association and Pacific Region Educational Laboratory, provides an up-to-date focus on the marine environment and integrates the study of technology.

Close observation of programs being developed at CRDG is important to ensure that students and teachers are offered educational programs that work. If a new technique or approach is not working, it's quickly detected in the trial site classroom at the lab school, says Krause. Teams of teachers constantly monitor and evaluate the classes' effectiveness and students' progress.

The lab school is the birthplace and proving ground for many educational improvements in the Hawai'i State school system.

"Lab school students benefit from experimental classes," Krause adds. "Teachers tend to teach the way they learned; new teaching strategies, techniques and curricula developed at CRDG and tested in the lab school give them a variety of ways to help children learn." The result is a more effective educational experience.

The diverse makeup of the school is a lesson in itself, observes Caroline Wong, an 18-year-old from Waikele, who has attended the Lab School for 14 years. "You have different kinds of people from all over, from different races and economic situations," she explains. "It prepares you more for the world." Wong says she has become more aware of different cultures, which makes it easier for her to adapt to different situations.



A CRDG-developed math program has kids, like these University Laboratory School students, working together to discover answers

Parents like the Lab School also. Only 50 new openings are available each year and, typically, 1,500 children are nominated to fill them. Students are selected to reflect the demographics of the state rather than its academic elite.

Two issues King and Krause are particularly passionate about: first, memorizing lessons is "out" and investigating and discussing solutions to problems "in." Second, children shouldn't be segregated by ability. Separating students into different learning "ability groups" is detrimental to everyone in the class, King explains. "Everyone can learn and we can teach them. We trust the old saying: 'What's good for the best is good for the rest,' and we try to take that as far as we can."

For example, the Hawai'i Algebra Learning Project's ten years of educational research on how children think mathematically has changed notions about the way children learn algebra. The resulting text, *Algebra I: A Process Approach* is designed for a heterogeneous classroom, where students of all ability levels learn effectively together.

In a lab school algebra class, eighth graders cluster in groups of four as two students use an overhead projector to demonstrate how they solved a homework problem. Students query each other about different solution options. The teacher facilitates the discussion, asking about the processes involved. All the while, three video cameras record the class session for in-service teacher training.

"Children have marvelous ways of improving themselves if given half an opportunity and if given the support and confidence," Krause observes.

In another mathematics project supported by National Science Foundation and Eisenhower National Clearinghouse grants, teacher Gary Martin literally maps the progress of his geometry students throughout the semester. Using a grid of Post-it notes on his office wall, he plots concepts to be covered in class each day. Instead of focusing on one concept per class session, he and his students revisit each topic across seven to nine lessons. For example, the students learn about sectors of circles by working one or two problems daily, but also on their plate each day are problems in other topics, such as arcs and parallelograms. Most of all, they focus on discovering their own answers rather than memorizing the teacher's.

"Teachers are used to telling answers, but we want the students to think

and get the answers themselves," Martin says. "We want the teacher to be a helper rather than a teller."

Jay-Calvin Uyemura-Reyes says the lab school's innovative teaching methods helped him a great deal. The 1993 graduate, a state Sterling Scholar in mathematics, now attends the University of Hawai'i at Mānoa. "The style of teaching is very dynamic. It gets students involved," Uyemura-Reyes says.

One exercise, he recalls, prepared him for his college entrance exams. In all his English classes since sixth grade, he was required to write for five minutes each day on a particular topic "to practice getting our thoughts down on paper," Uyemura-Reyes says. "When I had 20 minutes to write an essay for the (university entrance) exam, I was ready, but I overheard other students say they didn't know how they could do it."

CRDG and lab school personnel point to a growing list of curricular successes.

- "The Performance English Project's language immersion approach is catching on," says project head Jim Harstad. "This summer we will publish the Journal Freewriting Handbook."

- Another successful product is A History of Hawai'i, developed by CRDG's Eileen Tamura and Linda Menton. The text, used by three out of four Hawai'i public high school students, received the Award of Merit, the most prestigious honor conferred by the American Association for State and Local History.

- Leon Burton and other writers developed a series of 37 textbooks for The Comprehensive Musicianship Program. More than 5,000 Hawai'i teachers have participated in university courses and in-service workshops since the program began in 1972. A million students have participated in the CRDG-developed music program during the past two decades.

CRDG's involvement isn't limited to course content, however. Nearly 140 teachers in 22 secondary schools in Hawai'i are working with CRDG staff on a program that reduces absenteeism, student distress and failure in the schools. Using educational concepts born of the middle school movement, the program organizes and empowers small teams of teachers who share the same students. CRDG staff under the direction of Tom Stone lead the Hawai'i School Success Project, as this effort is called.

Longevity is a CRDG hallmark. King has been there since 1965, Krause since 1962. The science department's Francis Pottenger, music's Burton and 14 other section and project heads are 20-year veterans of the school.

Why do the teacher-researchers stay so long? "The corps under Dr. King's direction has really felt the importance of our work," Krause says. "We have a rare opportunity to work with teachers to effect change in our schools and we feel valuable and valued."

Students at the lab school likewise express feelings of self-worth. Cathy Caballo, a 17-year-old senior from 'Aina Haina, believes she gets more individual attention. "Lab school teachers help us find answers within ourselves, which is something we do not get to do in a normal school," she says.

Some aspects are timeless and universal, however. When asked what he likes best about first grade at the lab school, 6-year-old Scott Nishimoto answers: "Recess." M

Pam Nakaso is a freelance journalist living in Kailua

OVER 2 MILLION SERVED FAST

A CRDG science package that includes both curriculum and teaching strategies has brought science to life for more than two million school children around the world.

The hands-on Foundational Approaches in Science Teaching, or FAST, was developed under the direction of CRDG's Francis Pottenger over a 28-year period at the University of Hawai'i Laboratory School. It focuses on learning through inquiry and discovery by the students.

About 400,000 intermediate and middle school students—including 16,400 in Hawai'i—participated in FAST this past year. The program was used in more than 40 states and in countries from Australia to Abu Dhabi, Singapore to former Soviet republics. It is available in Braille for the visually handicapped and is being translated into Hawaiian for the Hawaiian language immersion schools.

The success of FAST spawned an elementary science program called DASH, for Developmental Approaches in Science and Health. Funded by the Hawai'i Department of Business, Economic Development and Tourism and the National Science Foundation, DASH has been used by more than 2,500 public school teachers in Hawai'i. Another 1,000 teachers are scheduled for training over the next three years, which will bring the program to 70 percent of Hawai'i's youngsters. In addition, 3,000 teachers and 100,000 students in 18 states and in New Zealand use the program.

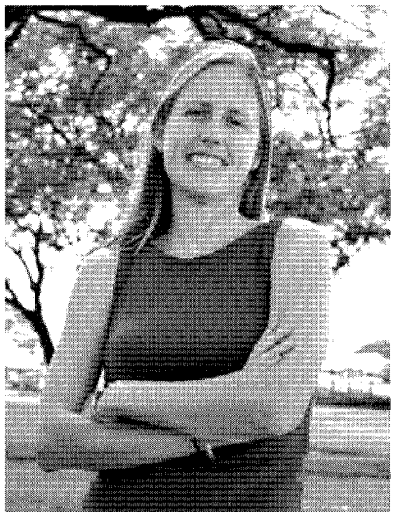
FAST and DASH, like other CRDG-developed programs, have received awards from groups that assess educational curricula and programs. FAST has been named an exemplary science program by the U.S. Department of Education's National Diffusion Network and National Science Teachers Association and identified as a successful practice in science education by the Pacific Region Educational Laboratory. DASH holds similar honors from the National Diffusion Network and Pacific Region Educational Laboratory, as well as a successful practice in science education designation from the Research for Better Schools Laboratory.

Development of such programs benefits Hawai'i in both social and economic ways, CRDG Director Arthur King points out. The locally produced curricula improve education for children in Hawai'i when used at home and creates a marketable product for export.

How to Get Students to Use New Skills

Teachers use a practitioner model to move away from memorizing and encourage depth of learning.

by Lisa Morehouse



She Walks the Walk: Marybeth Hamilton, an alumna of ULS, helps prepare her students for real life. Credit: Nina Lee

This how-to article accompanies the feature "Hula High: Where Everybody Is a Doer."

"What use is technical knowledge or facts you learn from books if you don't know how or why to use them?" asks Marybeth Hamilton, an English teacher at the University of Hawaii's Laboratory School. Under ULS's practitioner model, she says, students are required to employ the skills they learn, using knowledge grasped in the classroom, like experts in the field.

A practitioner model moves students away from memorizing what Don Young, director of the ULS Curriculum Research and Development Group, calls "independent factoids." By treating students who are studying science like scientists, he adds, teachers encourage depth of learning, long-term retention of concepts, and awareness of the interconnectedness of disciplines.

Young, Hamilton, and hula instructor Alison Hartle explain how any teacher can turn students into doers.

Think about how real practitioners study and learn new concepts. Identify the core questions of your subject area -- What are the big questions in math? What do historians puzzle over? -- then set up some classroom rituals that mimic how practitioners learn. In science classes, let students create their own labs to test hypotheses. Have art students emulate and imitate work by masters. Integrate lots of interviewing into a history curriculum and have students compare stories they hear. Add a five-minute reading component to journal-writing time, emphasizing to students that real authors share their writing and need to have a sense of their audience.

Work locally with a real practitioner. In the ninth-grade Marine Science class, ULS students work with other schools and zoology graduate students collecting data in intertidal zones that no one else is researching. Contact your local university to tap into existing partnerships with researchers or graduate students (like the National Science Foundation's Graduate Teaching Fellows in K-12 Education), or talk to a professor whose work interests you and start a small exchange that can grow.

Create opportunities for students to teach. Last fall's hula focus was the historical *ali'i*, or royalty, including Queen Lili'uokalani. Students brought what they learned in the Modern History of Hawaii course to hula, making even more relevant the meaning of the hulas and chants. Teachers who can't integrate their curriculum with colleagues can create independent assignments to help students share context and knowledge with each other.

Encourage students to use multiple sources to find many "correct" answers. ULS hula students have a "hula book" designated for notes and vocabulary work. After receiving Hawaiian-language versions of hulas and chants, they have to consult family members, dictionaries, and online resources for definitions. Back in class, students discuss the different definitions of words they've located, then debate in order to establish group translations of the hulas and chants.

"In a student-as-practitioner classroom, teachers need to be open," Hamilton says. Her English students talk about components of a good short story, which they pick up from listening to stories read aloud. "I will ask students to use these components, but when the final product comes in, it is ultimately up to each student to use the devices appropriate to his or her story," says the teacher. "As long as students are making deliberate decisions about how they want to write, I need to let them try it. I have been surprised a number of times by students who chose to do something against my advice and ended up with a better final product without my change."

Have an end goal. Performances, presentations, displays, publications, and entries into contests are essential for student buy-in. ULS's hula class spends the semester gearing up for a final performance, and Hamilton's seventh graders forget how hard they're working on their writing when they focus on creating podcasts. "When I tell students they are going to create a podcast of their own stories, they get excited," she says. "This buy-in from the students gives them a purpose to learn new skills and a reason to come to school."

Use what's already out there. Many teachers and organizations already are experimenting with these instructional ideas. Along with resources that may be more local to you, check out ULS curricular materials and professional opportunities online.

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