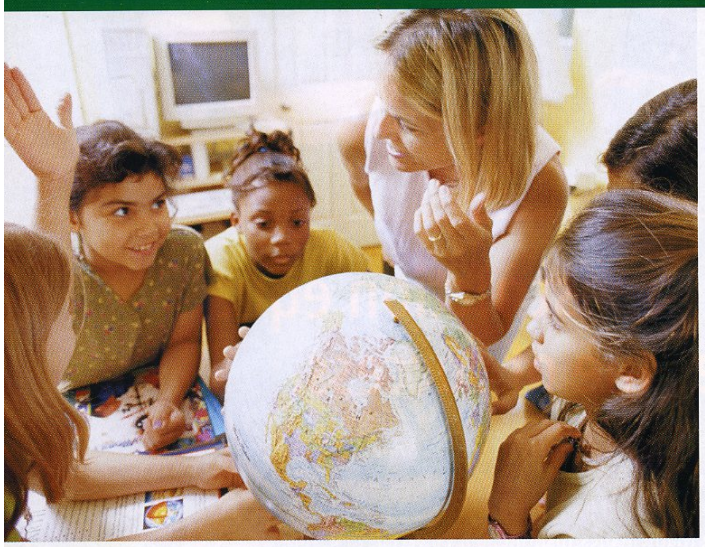
Lessons from Research Changed



New federal legislation has emphasized using rigorous scientific research to evaluate teaching practices and curriculum materials. New proposals call for more peer review panels, random-assignment experiments, and research syntheses. At the same time, plans to dramatically restructure the existing Office of Educational Research and Improvement would establish a new academy to direct government-funded research, which would favor empirical types of experiments.

Undoubtedly, too much shoddy, unreliable work under the guise of research gets reported each year and misleads those who would make use of it. As the government reexamines its role in education research and alternative research models, we should review which kinds of research have had the greatest impact on education. During the past 50 years, I have witnessed how noted researchers and their research-based formulations have influenced U.S. Supreme Court decisions, curriculum and instruction, early childhood education, and policies regarding small class size, standards-based reform, and productivity.

U.S. Supreme Court Decisions

1947 Kenneth & Mamie Clark

School integration. In one of the earliest psychological studies of racial identity, the Clarks (1947) gave young African American children a choice between black and white dolls and observed that African American children expressed a preference (albeit slight) for white dolls and chose white dolls as looking most like themselves. The National Association for the Advancement of Colored People attorneys used the Clarks' conclusion that young African American children often have negative self-images as a major argument to support their case to the U.S. Supreme Court that separate but equal schools were inherently unequal.

The 1954 *Brown v. Board of Education* decision ended the legality of racially segregated schools and was the first Court decision to use such psychological data as the Clarks' to reach its decision. The Clarks' research had an enormous impact on school policies, court cases, and social policy throughout the United States.

1967 Art Wise

School finance. Wise's study of inequities in finance (1967) became a central argument for the U.S. Supreme Court's unanimous decision in *San Antonio Independent School District v. Rodriquez* (1973), which requires states to equalize the financing of public education.

Rather than examine differences in funding in states or school districts, Wise conducted an in-depth legal analysis of previous state, federal, and U.S. Supreme Court decisions. He developed the argument that inequities in funding within a state constituted a violation of the equal protection clause of the U.S. Constitution.

That Education

A review of the most influential research of the past 50 years should encourage us to leave room for initial trials and innovative approaches.

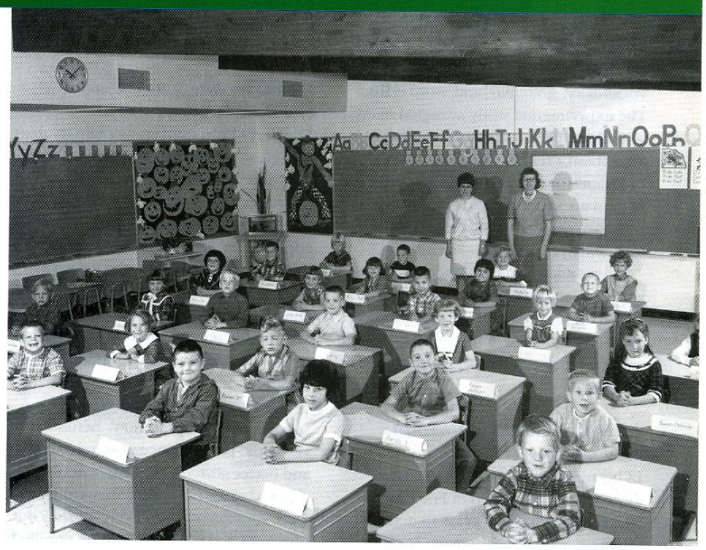
Gordon Cawelti

The decision left the remedies for unequal financing to the states. Many lawyers have used Wise's research and analysis to develop their cases.

Curriculum and Instruction

1949 Ralph Tyler

Tyler's scientific approach to curriculum had its origins in a large-scale research project, the famous Eight-Year Study of high school curriculums during the 1930s (Aiken, 1942/2000), which he later shaped into principles that included defining appropriate learning objectives, selecting useful learning activities, continually re-evaluating curriculum, and revising instruction that did not yield results. His 83-page book (1949/1969), originally published as a college course syllabus, remained influential for the next 50 years and contributed to the concept of mastery learning developed by Benjamin Bloom and others.



1979 Ron Edmonds

The research of Edmonds (1979) and other prominent scholars of the 1970s seriously challenged the findings of Coleman (1966) and Jencks (1972) and their colleagues, whose research had concluded that schools do little to lessen the achievement gaps between rich and poor or between more and less able students. Edmonds's work showed different results, and he quickly became a highly visible and articulate spokesperson for the belief that all students can learn. Edmonds showed that high student achievement correlated very strongly with strong administrative leadership, high expectations for student achievement, an orderly atmosphere conducive to learning, an emphasis on basic skill acquisition, and frequent monitoring of student progress.

Although some scholars scoffed at this research's lack of rigor, several investigators replicated the research by using these findings, and the study influenced thousands of educators working in schools in which students from low-income families tended to achieve less well than others.

1984 Madeline Hunter

Using earlier research on learning to formulate her approach, Hunter (1984) taught thousands of teachers and administrators such principles as focusing students' attention for a new lesson through anticipatory activities, clearly stating the purpose of each lesson, and providing opportunities for guided and independent practice. A trained psychologist, she synthesized findings from earlier research and developed a useful language for teaching with a model similar to the direct instruction approach that others developed. Few individuals have produced the large impact Hunter had in formulating and helping teachers apply effective lesson design.

1990 Robert Slavin

In an instructional system developed on the basis of research on tutoring and reading, Slavin and colleagues (1990)

compared students in a Baltimore elementary school using the experimental Success for All program with students from a nearby school. Students in the Success for All program had tutors outside of regular reading time and participated in a reading program that featured flexible achievement groupings. Teachers received manuals with very specific directions (some called them scripts) to follow in the daily lessons.

Results tended to show superiority for Success for All students on an extensive battery of pre- and posttests of vocabulary, grammar, and word skills. The experimental study attracted many schools because its findings tended to show better results than did typical programs for disadvantaged students. As with many such studies, other investigators have derived smaller effect sizes when analyzing Success for All data.

Nonetheless, this evidence-based approach to whole-school reform influenced the development of comprehensive school reform models that have received major public and private funding.

Early Childhood Education

1969 Jean Piaget

In his pioneering study, Piaget interviewed young children in France and Switzerland for many years to determine why they gave similar wrong answers on tests at similar ages. His work gave rise to the recognition that children construct knowledge through the ways in which they adapt to their environment (Piaget & Inhelder, 1969), and much research on the constructivist approach to teaching and learning has followed.

Best known for the four periods of intellectual development that he observed in children at various stages, Piaget forged new ways of thinking about how young children learn. His research has inspired the use of manipulatives in mathematics, play as an important learning activity, and integrated curriculums that help children recognize relationships more easily. The research of other international scholars—such as Erik Erickson, Maria Montessori, and Lev Vygotsky—has complemented Piaget's work.

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1980 Lawrence Schweinhart and David Weikart

The Perry Preschool study (Schweinhart & Weikart, 1980) followed 58 3- and 4-year-olds who attended school five mornings a week for two years and were actively involved in the Piagetian approach of planning and carrying out their learning activities. The experiment compared their progress with that of 65 children who were comparable in I.Q. and socioeconomic status but who did not participate in an early childhood program.

The Perry students had greater success while in preschool, better academic performance at school entry, and better attitudes toward school. Tracked since then, the Perry students were significantly less likely to drop out of school and more likely to be enrolled in postsecondary education.

This classic piece of longitudinal research and others like it have helped make the case for increased funds for Head Start and other community programs of early childhood education.

Policy

1990 Jeremy Finn, Charles Achilles, and Helen Bain

Class size. Tennessee's Project STAR (Student Teacher Achievement Ratio) garnered much attention because it was a controlled scientific experiment—a quality piece of research involving a large number of students in random assignment control groups (Finn & Achilles, 1990). Helen Bain played a major role in getting funds for the original research and appropriations for expanded use of small classes in Tennessee.

For four years, the 79 schools involved in the study randomly assigned thousands of students to classes of different size. Students in the smaller classes scored higher on the Stanford Achievement Tests in reading and mathematics, and a follow-up study showed that the benefit of smaller classes remained at 7th grade. Even more important, the benefits were larger for minority children assigned to small classes. These findings influenced subsequent funding decisions for class-size reduction by the Clinton administration and by Tennessee, Wisconsin, and California.

1991 Marshall Smith and Jennifer O'Day

Standards-based reform. Many forces were at work in the push for standards-based reform, but Smith and O'Day's research into the effectiveness of traditional education policies and their analysis of flaws in previous attempts at school reform (1991) helped formulate the new focus of state education agencies on improving student achievement. The authors emphasized the importance of establishing state-level standards and assessments for what students ought to know and be able to do, providing incentives and intervention strategies, and restructuring schools, districts, and states to focus on teaching and learning. They advocated teaching and assessing complex thinking and problem-solving skills, but this focus has received less attention among the state assessment plans, often simply because of costs. The emphasis on lower-level skills remains one of the undesirable side effects of the standards-based reform movement.

1993 Margaret Wang, Geneva Haertel, and Herbert Walberg

Productivity. In this landmark piece, Wang, Haertel, and Walberg (1993) employed a statistical technique known as meta-analysis to ascertain the effects of particular education practices and policies. Using an extensive literature

review and ratings by experts, they employed a mathematical formula to summarize the relative contribution made by each of the half-dozen factors. The results showed that student variables, such as motivation, produced the greatest effect, with classroom practices a close second. Home and community variables and differences in curriculum design produced less powerful effects. Overall school policies and district and state governance or organizational matters received the most political attention but had the least influence. Although some educators view meta-analysis with little enthusiasm, the technique does uncover important relationships by summarizing large numbers of similar studies in a systematic fashion. Wang, Haertel, and Walberg's work continues the tradition of scientifically based approaches to reform begun a century ago by such leaders as Joseph Mayer Rice.

The Art of Research

These research reports have had major impacts on education policy and practice. They often did not meet the rigorous requirements that many would have liked. In fact, only two—Project STAR and Success for All—employed the randomly assigned control group design that the government now encourages. Nonetheless, these studies were pioneering in highly important areas, and some of the best work appeared following years of research in related areas, such as psychology or statistical analysis, which scholars then used to formulate fresh approaches to earlier work.

Debate about research findings is part of the process. Eliminating bias is difficult, but the best scholars make serious efforts to avoid it. They also seek out the best research done by scholars around the world; today's technology makes such efforts even more feasible.

The task of improving government-sponsored research should involve replacing bureaucratic inefficiency and political intrusions with swifter and more responsive processes and structures to ensure high-quality research. Teachers and administrators need a better process for producing research and development that puts important findings to work in the classrooms sooner. Spending substantial funds to produce new knowledge about learning and improving achievement must not overlook the development stage of research and should be sure to include improved follow-up field trials.

Research policy changes that might discourage innovative approaches to research by insisting on particular requirements would be a mistake.

The quest for high-quality research by leaders in the U.S. Congress and officials in the U.S. Department of Education should continue. Research policy changes that might discourage innovative approaches to research by insisting on particular requirements, however, would be a mistake if the results were fewer studies like these seminal studies of the past half-century. In the end, we should all recognize that great research, like great art, will always need room for variations, new approaches, initial trials, and later refinement. ■

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