LEARNING HOW TO LEARN

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JOSEPH D. NOVAK AND D. BOB GOWIN

Department of Education
New York State College of
Agriculture and Life Sciences
Cornell University

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FOREWORD

During the past year two aspects of my life have often been juxtaposed. As president of a national teaching association, I have served on state and national commissions concerned with clarifying the crises in science education and I have traveled the country discussing the identified crisis with classroom teachers. As a science educator concerned about how students, particularly female and minority students, learn, I have assessed and analyzed learning among black teenagers who used the constructs described within this book. What amazes me in retrospect is how and why those two activities were so separate, so distinct. Surely the first concern of the prestigious commissions and researchers, as well as the journalists who publicized their work, was how children learn. Yet neither in the headlines nor in the footnotes did I find references to meaningful learning – to education. Rather, I read about training, testing, disciplining, and employing. Yet, shouldn't the science education of the children in my research help them think about the consequences of using a nuclear weapon as well as teach them how to read the operational manual and run the machine?

As the hoopla concerning the crisis fades and the work of rejuvenating education begins, I suggest that parents, teachers, administrators, and researchers read this book. It succinctly and clearly presents a view, a theory, of how children learn and, therefore, how teachers and others can help children think about science as well as other topics. Its ideas and techniques may be adopted for preschoolers when objects are conceptually ordered, or for theoretical physicists when findings are conceptually organized. In addition, the authors offer evidence that their propositions work, that children can *learn how to learn*.

Two of the constructs described and discussed in the book, Concept and Vee diagramming, augment learning by combining the the-

oretical with the practical, the unfamiliar with the familiar. The third one, clinical interviews, allows teachers and parents to assess such integration. Together they build a firm foundation for learning and for thinking.

Perhaps times are changing. Recently I gave a workshop, mandated by a state's commission on education, for some rather reluctant science teachers. They were tired of unsolicited, external edicts about longer school days, fewer teacher aides, more student-centered laboratories, student and teacher competency tests, and differential teacher pay. Politely they listened to my summary of national reports; quietly they assessed texts with readability formulas; passively they evaluated computer software. But the atmosphere changed when I introduced concept mapping. Enthusiastically and eagerly, they sought more information on how children learn because they could relate the material to learning problems in their classrooms. I believe that changes will come not from legislators or commissioners, but from classroom teachers. Novak and Gowin relate learning with teaching in a way designed to help classroom teachers who, in turn, will educate our children.

Jane Butler Kahle

West Lafayette, Indiana

PREFACE

THIS BOOK was written for all those who believe that learning can be more effective than it now is, either in schools or in any other educational setting. The work grows out of sixty years of the authors' combined experience and research dealing with problems of educating in classroom and field settings.

For almost a century, students of education have suffered under the yoke of the behavioral psychologists, who see learning as synonymous with a *change in behavior*. We reject this view, and observe instead that learning by humans leads to a *change in the meaning of experience*. The fundamental question of this book is, How can we help individuals to reflect upon their experience and to construct new, more powerful meanings?

Furthermore, behavioral psychology, and much of currently popular "cognitive science," neglects the significance of feelings. Human experience involves not only thinking and acting but also feeling, and it is only when all three are considered together that individuals can be empowered to enrich the meaning of their experience. All readers of this book have surely experienced sometime during their schooling the debilitating effect of an experience that threatened their self-image, their sense that "I'm OK." We have found repeatedly in our research studies that educational practices that do not lead learners to grasp the meaning of the learning task usually fail to give them confidence in their abilities and do nothing to enhance their sense of mastery over events. Whereas *training* programs can lead to desired behaviors such as answering math problems or spelling correctly, *educational* programs should provide learners with the basis for understanding why and how new knowledge is related to what they already know and give them the affective assurance that they have the capability to use this new knowledge in new contexts. Schooling is too often an assault on students' egos because the rote, arbitrary,

verbatim instruction so common in classrooms has few intrinsic rewards. Students who do seek meaning in such instruction often fail. For them, school is at best frustrating and at worst an ordeal in which they must suffer the ridicule of teachers, classmates, and sometimes parents. We commonly blame these victims for failing at rote learning, and categorize them as "learning disabled" or, more denigrating, school dropouts or simply losers. The cost of these failures, both to the individuals and to society, is enormous.

We have come to recognize that questions of learning cannot be addressed comprehensively unless we consider simultaneously questions dealing with three other commonplaces involved in education: teachers and how they teach, the structure of the knowledge that shapes the curriculum and how it is produced, and the social matrix, or governance, of the educational setting. In any episode of educating, all four must be considered. The strategies we present are designed to enhance educating by helping learners to learn about human learning, about the nature of knowledge and the construction of new knowledge, about strategies for better curriculum design, and the possibilities for governance of education that is liberating and empowering.

We do not intend to demean teachers. We seek instead to celebrate the sense of achievement that results when students and teachers share meanings and give emotional support to each other. The relationship between students and teachers need not be an adversarial one – poor pedagogical practices or a poor curriculum, or both, are usually to blame. Much that is wrong with education can be changed, and most of the needed changes are not expensive. Although programs that offer new pedagogical strategies or create new curricula do cost money, it costs us very little to change our minds. Are our ideas cost effective? We need only consider one point. Teachers have been working very hard to achieve what is both impractical and burdensome, and therefore costly: We have expected them to *cause* learning in students, when of course learning must be *caused by* the learner. When students learn about learning in the ways we recommend, they take charge of their own learning. Relieved of the burden of having to cause learning, teachers can concentrate on teaching. When the goal of teaching becomes the achievement of shared meaning, a great deal of both teachers' and students' energy is released. The strategies offered in this book can not only help learners, they will also make better and more powerful teachers. And therein lies much of the

potential of the book, for in the course of a career, a teacher can influence the lives of thousands.

There is, we believe, a solid theoretical foundation for the practical strategies we put forward. This is a "how to do it" book with a solid theoretical base and considerable empirical research behind its claims. Throughout the book, we cite our own and others' works, as well as the Master's and PhD theses of some of the more than fifty students who have worked with us. But we are not out to convince the skeptic. Rather, our purpose is to provide workable strategies to help students learn how to learn. We also illustrate how these same strategies can be applied to better organize educational programs and to benefit future research in education. We recognize that helping students learn how to learn in the sense we intend is a new and profoundly important endeavor. Because we have just begun to explore the human potential for learning, our ideas will undoubtedly be revised and expanded in the future. Our experience has shown us, however, that the basic strategies we propose are useful and powerful, and can only become more so as they evolve.

So we invite you, the reader, to join us in an adventure in education that is potentially revolutionary and has no limits, for there are no limits to the power of the human mind to construct new meanings from experience.

J. D. Novak
D. B. Gowin

Ithaca, New York
May 1984

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