

**REDEFINING EDUCATION IN THE
TWENTY-FIRST CENTURY**

REDEFINING EDUCATION IN THE TWENTY-FIRST CENTURY

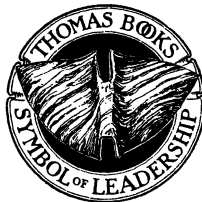
**Shaping Collaborative Learning in the
Age of Information**

By

DENNIS ADAMS

and

MARY HAMM



CHARLES C THOMAS • PUBLISHER, LTD.
Springfield • Illinois • U.S.A.

Published and Distributed Throughout the World by

CHARLES C THOMAS • PUBLISHER, LTD.
2600 South First Street
Springfield, Illinois 62704

This book is protected by copyright. No part of
it may be reproduced in any manner without
written permission from the publisher.

© 2005 by CHARLES C THOMAS • PUBLISHER, LTD.

ISBN 0-398-07587-5 (hard)

ISBN 0-398-07588-3 (paper)

Library of Congress Catalog Card Number: 2005047069

With THOMAS BOOKS careful attention is given to all details of manufacturing and design. It is the Publisher's desire to present books that are satisfactory as to their physical qualities and artistic possibilities and appropriate for their particular use. THOMAS BOOKS will be true to those laws of quality that assure a good name and good will.

*Printed in the United States of America
UB-R-3*

Library of Congress Cataloging-in-Publication Data

Adams, Dennis M.

Redefining education in the twenty-first century : shaping collaborative learning in the age of information / by Dennis Adams and Mary Hamm.

p. cm.

Includes bibliographical references.

ISBN 0-398-07587-5 – ISBN 0-398-07588-3 (paper)

1. School improvement programs—United States. 2. Educational change—United States. 3. Education—Aims and objectives—United States. 4. Education—Effect of technological innovations on—United States. I. Hamm, Mary. II. Title.

LB2822.82.A32 2003

370'.973'0905—dc22

2005047069

PREFACE

Nothing great was ever achieved without enthusiasm.

—Emerson

Broad cultural, social, and educational trends challenge old assumptions and invite new dreams. There is general agreement that we need better teachers to help students learn how to navigate today's unsettling reality. Unfortunately, there is little consensus about how to get (or even keep) the best and the brightest educators. Much of the oxygen surrounding the schools debate has been consumed by structural innovations like charter schools and vouchers. Such distractions have clouded over more important issues like developing quality teachers who can deal with the characteristics of effective instruction in the technologically intensive twenty-first century.

Redefining Education in the Twenty-first Century includes topics such as teacher professional development, the cognitive nature of learning, concepts gleaned from the research on brain functioning, and the pedagogical implications of technology. It provides educators insights into current educational issues and translates this information into possible classroom applications. Written in a style that the classroom teacher will find accessible, the book also explores new instructional developments, content in the classroom, performance assessment, and possibilities for building an active meaning-centered curriculum. Concepts like collaboration and critical thinking are addressed so that they can be considered as tools for inquiry in the core curriculum.

Reinventing the schools means changing how we think about instruction in an age where the traditional boundaries between politics, technology, culture, education, and ecology are disappearing. It also means changing school culture to accommodate a world where we are all so much more interconnected. When a century or an institution changes, there is a power struggle between what we know and what we can imagine. When schools feel the pressure to change the habit of the familiar, it often clashes with day-to-day routine. There are severe penalties if we succumb to distraction and indifference.

Reflection, discussion, and cultivating the disposition for critical thinking can always inform and enrich our teaching. So can more authentic assessment structures, like portfolios. Even teaching to the “test” doesn’t have to be a learning disaster with meaning-centered performance assessment. Whether its the teacher’s professional teaching portfolio – or the student’s work samples – these performance assessment processes are viewed as a step toward changing the nature of school assessment. This kind of fundamental change in the evaluation process can support changes in instruction, school culture, and the professional development of teachers.

There are some superb examples of high quality schools across the country. Many have been freed from at least some of the shackles of regulation and constant high-stakes testing. A few models of excellence have been around for some time without many public educators being able to trudge through a bureaucratically mandated swamp and get to them. A moat, full of administrative and statutory restrictions, often surrounds the possibilities for positive change in the public schools. Strict accountability under these conditions is not realistic. Before high assessment standards are applied, teachers and school administrators need more resources and control over their school environment.

There are no “silver bullet” solutions to America’s educational problems. We must all show a great deal of respect for the complexity of the problems we set out to solve. Schools can make a difference, but they can’t do it alone. We are all responsible for the dire straits and dilapidated condition that many of our schools find themselves in. Failures in leadership, lack of public will, and social policy have more to do with it than educators. For example, teachers have had little or nothing to do with the fact that America’s urban environment has lost many of the psychological, moral, and material prerequisites of societal life. Cultural decay, global economic competition, and political lethargy have all contributed to the decline in the public sectors of American educational life. Even in the most favorable economic times many communities and their schools are left behind.

Thirty years ago this country had the world’s best educated work force. Not investing in our human capital is a major problem in the United States. While Germany and Japan invest about five percent of their gross national product (GNP) in their educational infrastructure the U.S. can only come up with one percent. On a more positive note, the United States has more technological capital than any country. Used intelligently, the Internet, for example, gives American teachers the opportunity to create a medium that can spark a student’s imagination, enhance a teacher’s freedom, and improve every school. Used in an undisciplined way it can be a colossal waste of time. It depends on how the technology connects to curriculum goals. There is no guarantee that technological marvels or anything else will help every child live out his or her potential in a more prosperous and just society. However, it is our belief that

there is enough imagination, intelligence, compassion, courage, and money in this country to get the job done.

Economically the U.S. represents more than a third of the world's total GNP; our closest competitor, the Japanese, represents about 15 percent. Clearly, the United States does not have to choose between its children and its ideals. Democracy in both education and life is imperfect. It does not always turn out well; but without it things usually turn out badly. We may not be able to guarantee every child a wonderful home life, but we should be able to provide a high quality education for all of our children. This book stresses realism, idealism, hope, and curriculum possibilities for developing schools worthy of our children. Everyone's future depends on creating a better educated, freer, more efficient and more stable America.

The most powerful way to strengthen our democratic society is to strengthen our schools. You can't predict the future, but you can learn about the terrain you must operate on. Certain guidelines and basic principles will not disappear. For example, the curriculum has to be meaningful, make connections, emphasize responsibility, and reflect human values. We can also be sure that topics like professional development, authentic assessment, content standards, collaborative inquiry, and new technology will not disappear from the educational debate.

This book maps some possible routes to be taken today, and explores conceptual principles that have meaning for tomorrow's schools. As we set out to improve schooling, it is important to recognize that change is never completed because everyone is constantly learning and experiencing insights for practice, research and colleagues. About the only thing that is permanent now is change itself. The days of stationary educational goals are over; hitting moving targets is part of today's reality. You can be sure that in the twenty-first century there will always be waves of change flowing across any structure we build.

INTRODUCTION

R*edefining Education in the Twenty-first Century* explores issues, trends and practical ideas for teaching and learning in a new era. The book provides specific classroom activities and connects them to recent pedagogical developments that reach across the curriculum. It builds on our expanding knowledge of what works in classrooms. It goes on to suggest how new approaches to teaching and learning can transform our schools. Ideas and activities for standards-based active learning, collaborative inquiry, and communications technology are included.

All of our suggestions connect to the content standards, the research, and our experiences with workshops and classes around the country. We have found that there is frequently a disconnect between what children need to know in the Age of Information and the day-to-day life of the classroom. *Redefining Education in the Twenty-first Century* is designed to help correct that imbalance and assist educators as they develop ways of teaching students what they must know in the twenty-first century. Many of the methods in this book are widely recognized as good paths to effective instruction; a few look promising, but have not proven themselves. Whatever the approach, a shared objective is making the schools more exciting, more humane, and more intellectually rigorous places.

In today's rapidly changing world suggestions are in, blueprints are out. As we set out to improve schooling it is important to recognize that change is never completed because everyone is constantly learning and experiencing insights from practice, research, and colleagues. It is little wonder that a key element of educational reform is the ongoing professional development of millions of teachers. This book is designed to help that effort and assist educators as they strive to make schools more exciting, more humane, and more intellectually rigorous places.

It is important that on our way to the future we capitalize on what we know about how children learn best. *Redefining Education in the Twenty-first Century* offers an ideal starting point for those who need to think through the fundamental questions of what teaching and learning should be about in the world of today – and the world of tomorrow. The book is designed to help teachers

become more comfortable with the interactive methods and the technological tools that are arriving at the intersection of core subjects.

With today's world moving at Internet speed, teachers and students need time for observation, reflection, exploration, collaboration and a wide range of literacy-related activities. New circumstances, new technologies, and new approaches to teaching and learning are constantly opening up a wider range of literacy-intensive possibilities. *Redefining Education in the Twenty-first Century* is designed to deepen the collective conversation, challenge your thinking, and give you some up-to-date tools that you can use today.

*Knowing is not enough; we must apply.
Willing is not enough; we must do.*

– Goethe

CONTENTS

	<i>Page</i>
<i>Preface</i>	v
<i>Introduction</i>	ix
<i>Chapter</i>	
1. Introduction: Creating the Educational Future	3
2. Evolving Trends of Thinking and Learning	15
3. Collaborative Learning: The Shared Responsibility in the Cooperative Classroom	35
4. Communication Technologies	53
5. Assessment: Integrated Performance Assessments in the Elementary and Middle School Classroom	74
6. Language Arts in a New Era: Social Interaction, Digital Technology, and Language Learning	89
7. A Vision for Mathematics in the Twenty-first Century	110
8. Scientific Literacy: Active Inquiry in the Classroom	135
9. Informed Encounters with the Arts: Knowledge, Performance, and Connections	159
10. Inventing the Civic Future: Social Responsibility and Citizenship Education	188

**REDEFINING EDUCATION IN THE
TWENTY-FIRST CENTURY**

Chapter 1

INTRODUCTION: CREATING THE EDUCATIONAL FUTURE

The future is not a result of choices among alternative paths offered by the present, but a place that is created – created first in the mind and will, created next in activity. The future is not some place we are going to, but one we are creating. The roads to the future are not found but made, and the activity of making them changes both the maker and the destination.

– John Schaar

The last ten years we have seen major changes in science, technology, communications, the global economy, and the nature of human interaction. Although teaching and learning have taken on new dimensions, the schools have not changed as much as the world around them. The capacity of educators to deal with change, learn from it, and help their students manage the surrounding ambiguity is critical to educational reform and the future development of our society.

We are now entering a time where change forces and technological breakthroughs are reaching a critical mass. As the twenty-first century moves along the schools will not be permitted to live in the past. Retro can be a fashion, but it can't be the educational future. Information and communications technologies are just one of the reasons that the pace of educational renewal will have to quicken. As we move farther into the new century the advent of ever more powerful digital tools will require the schools to deal more effectively with these remarkable knowledge acquisition vehicles.

Looking ahead can be helpful, but often the most effective way forward is to look around. It has long been clear that while active learning and modern technology have great potential to enhance teaching and learning, but turning that potential into reality on a large scale depends on our educational

vision, teacher preparation, a well-designed curriculum, and the ability to respond to a rapidly changing world.

We need to look beyond our obsession with information technology and individuals to include the critical social networks on which these are always a part. The implicit educational power of better and more available technology has penetrated remote corners of the globe. Although many nations are more fractured than ever, people are tied to others around the world as never before. One result is a huge outflowing of information that contributes to shared cultural experiences. Another is the need to understand how interpersonal skills, communities, organizations, and institutions can contribute to making the richest possible use of technology in our work and in our everyday lives.

A more stimulating and aesthetic learning environment can be stimulated by combining new information distribution possibilities with the more personal collaborative aspects of interactive face-to-face learning. In the last seven years public school Internet access has gone from near zero to better than 90 percent. Of course, in some places that means that only a few computers are online. But the point is that networking possibilities are expanding rapidly. Today's technology supports global observation, interaction, and learning as never before.

It's a new world order. In the Age of Information the shape of a nation's future depends more than ever on the quality of its educational system. Technology is an important thing, but its not the only thing. Technology alone isn't sufficient. You have to have a pedagogical plan that recognizes the social nature of learning. Intellectually connected social and technological skills matter. But there is no AAA *TripTik* or predetermined route for education in the twenty-first century. The only certainty is that education will change along with everything else.

FACING AN UNCERTAIN FUTURE

Be careful how you interpret the world – it's like that.

We face a future where human communication, interaction, and learning are no longer bound by time, space, and form. The dilemmas faced by nuclear physicists in the last century may be somewhat analogous to those facing technologists and educators today. It has, however, become harder than ever to guess the sources from which future problems and impulses for dramatic educational and social change will come. What is clear is that change favors the prepared mind and the intellectual energy of a civilization matter. It is also clear that as schools prepare to greet the future they must be able to help students collaboratively perceive, analyze, interpret and discover a whole new range of meanings.

Fortunately, everything we know and value won't fade into oblivion. We now have e-books and interactive literature, but traditional paper books are an elegant user-friendly tool that won't go away. We can interact with people around the world, but we still need face-to-face cooperative group skills. No matter how technology gets added to the mix, children will still have to read, write, and do mathematics. Being able to evaluate information and taking an informed position on an issue will continue to be valued. The difference is that many valued attributes are going to be applied to new media and new situations.

Communication and information technology contributes to the process of inter linking all parts of the globe and to the local process of educational reform. It is not possible to solve "the change problem," but we can learn to live with it more productively and more pro actively. As the twenty-first century moves ahead change is ever more ubiquitous and relentless. This reality cries out for new definitions and people who can redefine themselves in terms of a rapidly changing environment. Continuous and active educational experiences are moving ever closer to the center of today's reality.

Educational models will be influenced by the experimental research on instruction, understandings about the social nature of learning, and advancing technological possibilities. Teachers can be sure that they will be called upon to shoulder some of the responsibility for devising a curriculum that helps produce citizens who can live and work productively in increasingly dynamically complex societies. Whether its high-tech or high-touch, there is no alternative to a high quality teacher in the classroom. It takes well-educated teachers to help students become inner and outer learners who will connect to wider and wider circles of society. But they can't do it unless everyone – from parents to the media – takes more responsibility for the education of children. Whether it is television, the Internet, or anything else – if a society doesn't exercise thought and scrutiny over a powerful communication tool – it will become more terrible and more crass and affect us in even more terrible ways.

The professionalization of teaching is one of the keys to schooling in a digital world. Professionals do have certain guidelines. But they do not follow a prepackaged script. In spite of Nietche's dictum, "dancing in chains" is not the highest art form. Teachers can usually make good use of some informed guidance. But they also need autonomy and flexibility. Accountability without control is a joke. When teachers have more voice, resources, and control over their schools than we can hold them more accountable.

The educational improvement of its people is one of the most fateful challenges facing the United States today. Every high quality educational future requires putting more resources into focused learning opportunities for teachers. Efforts are under way to move from traditional inservice training models to broader notions of professional development (Darling-Hammond, L., 1999). Perpetual staff development and school-embedded learning for teachers