THE NEW EDUCATIONAL TECHNOLOGIES AND LEARNING

ABOUT THE AUTHOR

Ibrahim Michail Hefzallah has been on the faculty of Fairfield University since 1968. At present, he is a professor of educational technology and the chair of the Educational Technology Department of the Graduate School of Education and Allied Professions. He received his Ph.D. from Ohio State University in educational media in 1959. Since then he has been engaged in teaching, research, and writing. He has authored and/or coauthored numerous articles, five Arabic textbooks, and three English textbooks in the areas of television, curriculum planning, and learning and communications media in the information age. His latest book publication was a spiritual novel titled *I Have Grown in His Love* (2003).

His articles have appeared in such publications as *Babel, The National Association of Secondary School Principals Bulletin, Educational and Industrial Television (EITV), International Journal of Instructional Media, Journal of Advertising Research, The Journal of the University Film Producers Association*, and *Vocational Guidance Quarterly*. Some of his research has focused on critical viewing of television, electronic publications, and the use of the World Wide Web in education.

In addition to teaching, research, and writing, Dr. Hefzallah is a producer and director of educational and cultural television programs. A sample of programs he has produced include *The Fairfield Gallery, Photographic Vision, Transcribing Jazz, Teaching Children About Families*, and *Design for Life*, all of which have been shown on Connecticut Public Television. *Design for Life* focuses on teenage smoking and received the American Cancer Society 1980 Connecticut Media Award. His latest production, *If These Stones Could Speak*, focuses on the story of Fairfield University as told in its buildings. It won The Communicator Crystal Award for Excellence in 1996.

Second Edition

THE NEW EDUCATIONAL TECHNOLOGIES AND LEARNING

Empowering Teachers to Teach and Students to Learn in the Information Age

By

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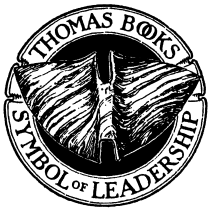

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To my family

PREFACE

When the first edition of this book appeared, the size of the web was estimated at 320 million web pages. Only 34% (108 million pages) of those pages were indexed. Pages that are not indexed stay invisible to search engines. Today, the web has over 17 billion web pages. Although only approximately 18% of those pages are indexed, the number of searchable pages has increased to over 3 billion web pages!

The increase in the size of the indexed web pages is just one example of the tremendous and fast pace of technology development that is affecting every phase of our lives and, of course, our educational practice. More and more technologies are introduced (software and hardware) providing the vehicles and tools through which excellence in teaching and learning may occur.

Statesmen, legislators, business leaders, parents, and educators are constantly advocating the infusion of technology in education. *The CEO Forum on Education and Technology* (2000) stated: "As part of our efforts at school reform, we should apply technology's resources to develop the full academic abilities of all our students."

Professional organizations interested in studying requirements for teaching certifications have recognized literacy in technology as an essential standard for teaching certification. Standards for technology-literate students have also been developed and practiced by many schools.

In light of recent studies, educational technology developments, and emerging educational needs of the twenty-first century, the chapters in the new edition have been revised and updated. A new section on children and youth's safety on the Internet was added, and a new chapter on television in education was introduced.

In the preface to the first edition (1999), I wrote: "Prior to the accelerated evolution of information technologies, educators advocated the need for individualized, flexible, interactive, interdisciplinary and up-to-date learning environments in which students control their own learning—necessary conditions to enable students to become educated persons. However, with reliance on textbooks and audiovisual supplements it was difficult, if not impossible, to implement such progressive educational practices. Today, the new learning and telecommunications technologies can help realize educators' pedagogical dreams." Five years later, that statement is still true; teachers are required to infuse technology in their teaching.

Ibrahim M. Hefzallah

PREFACE TO FIRST EDITION

As the world prepares to enter the 21st Century, the goal of education has become more focused than ever on cultivating truly educated persons. On the threshold of a new millennium, the drive for educational reform should not be propelled by business needs only. Emphasis should also be put on graduating people who can deal with change in our world—a change that is accelerated by the technologies of the Information Age. An *Educated Person* in this Age is one who is capable of maintaining a high quality of life, and of contributing to the betterment of the community and the world as a whole.

Information technologies have proven to be a significant advantage to the teaching/learning process. Developments in these technologies provide more powerful and versatile applications in education. One can look at our current era as the golden era of technology in education. Never before have educators had the wide and effective range of instructional and telecommunications technologies that are available to them and their students in and out of class. Educators have at hand very efficient tools to structure learning environments conducive to achieving the goal of education: the cultivation of the *Educated Person.*

Prior to the accelerated evolution of information technologies, educators advocated the need for individualized, flexible, interactive, interdisciplinary and up-to-date learning environments in which students control their own learning—necessary conditions to enable students to become educated persons. However, with reliance on textbooks and audiovisual supplements it was difficult, if not impossible, to implement such progressive educational practices. Today, the new learning and telecommunications technologies can help realize educators' pedagogical dreams.

This book examines these new learning and telecommunications technologies and their potential applications to enrich the learning process, to ensure educational equality for all students and to help cultivate the *Educated Person.*

Ibrahim M. Hefzallah

ENVIRONMENT, REFORM, TECHNOLOGY, AND TWENTY-FIRST CENTURY CHALLENGE

"We never educate directly, but indirectly by means of the environment."

John Dewey

"I have learned to undertake reform of the environment and not to try to reform man."

Buckminster Fuller

"We are unlikely to obtain the schools we want until we take greater advantage of the power of modern technology and its appeal to youth."

Howard D. Mehlinger

"Our economic survival and leadership in the free democratic world rest on the educated individuals of our nation. The need to achieve excellence in education and educational equity for everyone is urgent. Only when our quest is multilateral and targets the student as a whole person will we realize excellence in education."

Ibrahim M. Hefzallah

INTRODUCTION

Since man perceived the need to educate the young, educational goals and practices have been examined to assess the efficiency of the educational system. As a result, different views of educational reform have emerged. These views reflect the values and aspirations of those who express them, as well as their perception of the economic, social, political, national, and international conditions of the time. However, the road to educational reform has many paths, and one must consider a broad range of educated points of view to formulate a comprehensive vision of the goal of educational reform. Reforming education should not be driven by business needs only. It also should target the cultivation of well-rounded educated persons. Education for earning and education for learning are two sides of one coin, which form the goal of education: the cultivation of the *educated person.*

Since we educate by means of the environment, special attention must be given to the design of learning environments conducive to the cultivation of the educated person. An essential element of that design is ensuring the learner's interactivity with models of excellence, both in human resources and in learning materials. Fortunately, the technology of the information age provides students and teachers with the tools and vehicles through which models of excellence can be accessed.

This book is divided into four sections: *Education in the Information Age, The Learning Environment, The New Learning and Telecommunications Technologies,* and *Necessary Conditions for Effective Utilization of the New Learning and Telecommunications Technologies.*

Section I examines the need for educational reform, the goal of that reform, and the role of technology in realizing that goal.

Section II addresses the significance of the learning environment and the necessary conditions for providing teachers and students with access to models of excellence in human resources and in learning materials.

Section III presents the new learning and telecommunications technologies with emphasis placed on their potential applications in education.

Section IV focuses on necessary conditions conducive to the empowerment of the teachers to teach and the students to learn in the Information Age. Among these conditions are the cultivation of technology-literate teachers, technology-literate students, and effective school media specialists.

I.M.H.

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Part Three—The Internet

THE NEW EDUCATIONAL TECHNOLOGIES AND LEARNING

SECTION I

EDUCATION IN THE INFORMATION AGE

INTRODUCTION

Chapter 1, "Educational Reform," addresses the need for a comprehensive view of educational reform. It reviews various studies focusing on reforming education and presents the goal of educational reform as the cultivation of the "educated person."

Chapter 2, "The Educated Person in the Information Age," examines the basic characteristics of the modern age in an attempt to identify the qualities that an educated person should possess. Identifying these qualities is essential to the effective design of learning environments conducive to the achievement of these qualities.

Chapter 1

EDUCATIONAL REFORM

THE NEED FOR A COMPREHENSIVE VIEW OF EDUCATIONAL REFORM

Since man perceived the need to educate the young, educational goals and practices have been examined to assess the efficiency of the educational system. As a result, different views of educational reform have emerged. These views reflect the values and aspirations of those who express them, as well as their perception of the economic, social, political, national, and international conditions of the time.

Toward the end of the twentieth century, various studies and reports addressed the need for educational reform. One major report was the 1982 National Science Foundation's *Today's Problems, Tomorrow's Crises*. In this report, the National Science Foundation (NSF) alerted the nation to potential crises resulting from citizens not being prepared to participate fully in the technological world:

> We appear to be raising a generation of Americans, many of whom lack the understanding and the skills necessary to participate fully in the technological world in which they live and work. Improved preparation of all citizens in the fields of mathematics, science, and technology is essential to the development and maintenance of our nation's economic strength, military security, commitment to the democratic ideal of an informed and participating citizenry, and leadership in mathematics, science, and technology.[1]

In 1985 and 1992, The National Center for Education Statistics (NCES) conducted assessments of adult literacy. (A 2003 study, *The National Assessment of Adult Literacy* [NAAL], is under way[2]). The 1992 study indicated that almost half of the American adult population was much less likely to respond correctly to the more challenging literacy tasks that require higher-level reading and problem-solving skills.[3]

Proficiency scores of young adults who participated in the 1985 literacy survey were higher than the 1992's scores. The *National Adult Literacy Survey* (NALS) study suggested that this might be due to changes in the demographic composition of the population with an increase in the percentage of participants who learned English as a second language.[4]

The study referred to a current report from the American Society for Training and Development, which indicated that those individuals with poor skills "are condemned to low earnings and limited choices."[5] The 1992 data appeared to support this view. The report indicated that,

> On each of the literacy scales, adults whose proficiencies were within the two lowest levels were far less likely than their more literate peers to be employed full-time, to earn high wages, and to vote. Moreover, they were far more likely to receive food stamps, to be in poverty, and to rely on non-print sources (such as radio and television) for information about current events, public affairs, and government.[6]

Commenting on the study findings, Madeleine M. Kunin, former Deputy Secretary of Education said,

> The overall education level of Americans has increased in terms of schooling and even in fundamental literacy. But the demands of the workplace simultaneously have vastly increased. We simply are not keeping pace with the kinds of skills required in today's economy.[7]

Suffering from a workforce with a poor level of literacy, businesses estimated, then, "that they lose between $25 billion to $30 billion a year nationwide in lost productivity, errors and accidents attributable to poor literacy."[8] Driven by the need for employable and productive workers, businesses have been assuming assertive roles in education. These roles include adopting a school, offering training opportunities to students, providing teaching expertise to schools, donating money and/or equipment, and maintaining comprehensive training and development programs within their organizations. Davis, et al. (1994) noticed that Motorola spent $120 million dollars a year on employee education.[9]

No Child Left Behind Act 2001

Driven by the need to reform education, President Bush signed into law on January 8, 2002 the N*o Child Left Behind Act of 2001*. The Act redefines the federal role in K–12 education. "It is based on four basic principles: stronger accountability for results, increased flexibility and local control, expanded options for parents, and an emphasis on teaching methods that have been proven to work."[10]

The Act emphasizes:

1. Support of learning in the early years to prevent learning difficulties that may arise later.
2. Providing more information for parents about their child's progress and important information on the performance of their child's school.

3. Providing parents options to ensure that their children receive high-quality education in the event of a school's continued poor performance. That might mean that children can transfer to higher-performing schools in the area or receive supplemental educational services in the community, such as tutoring, after-school programs or remedial classes.
4. Hiring and employment of qualified teachers.
5. Measuring students' learning in English, mathematics, and science.
6. Providing more resources to schools, and focusing on what works.[11]

The *No Child Left Behind* (NCLB) Act states that American schools are not producing the science and math excellence required for global economic leadership and homeland security in the twenty-first century.[12,13] Explaining that claim, NCLB referred to the 2000 National Assessment of Educational Progress (NAEP) science test that revealed that 82% of our nation's 12th graders performed below the professional level.[14] In math, although the average math scores of 4th and 8th graders have slightly improved, still only one-fourth of our 4th and 8th graders are performing at or above proficient levels.[15]

The NCLB Act considers reading, writing, and speaking English to be at the root of any success an individual could achieve in society. However, only one-third of 4th graders are able to read at a proficient level.[16] The 2000 NAEP reading assessment showed that 40% of white 4th graders scored at or above proficient level compared to 12% of their African American peers, 16% of their Hispanic peers, and 17% of their Native American peers.[17–19]

Level of Students' Achievement and Employment

"Evidence strongly suggests that students who fail to read on grade level by the fourth grade have a greater likelihood of dropping out of school and a lifetime of diminished success," NCLB stated.[20] Correlation between level of education and a higher standard of living is also indicated in the U.S. Department of Education and the NCES *Digest of Education Statistics, 2000*. The digest reports:

> Adults with higher levels of education were more likely to participate in the labor force (including those who were employed and those actively seeking employment) than those with less education. About 79 percent of adults, 25 years old and over with a bachelor's or higher degree, participated in the labor force in 2001 compared with 64 percent of persons who had completed high school. In contrast, 44 percent of those 25 and older, who were not high school completers, were in the labor force.[21]

For ages 20 to 24, the picture is similar to those who are 25 years of age and older. About 85% of adults 20 to 24 years old with a bachelor's or high-