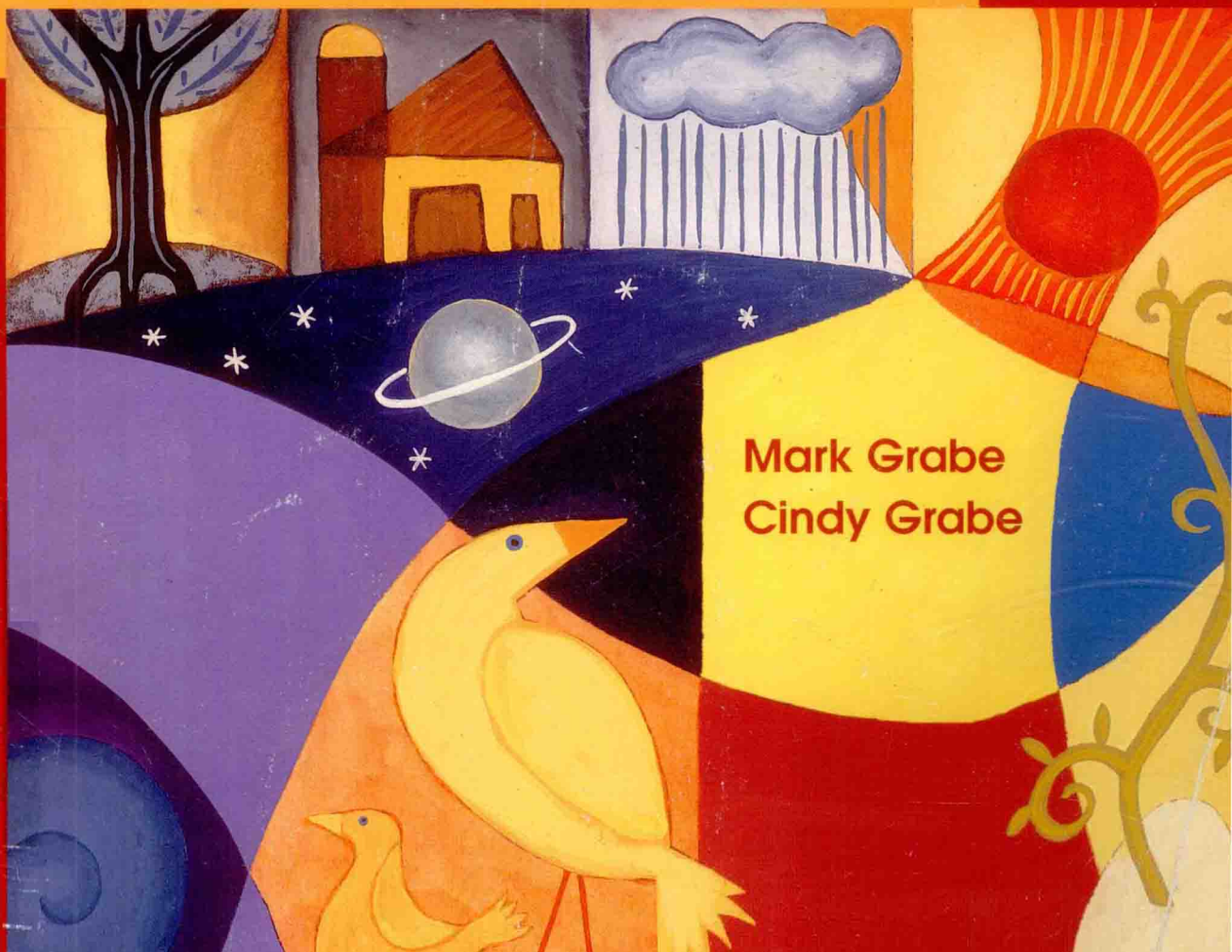
Integrating the Internet **for Meaningful Learning**



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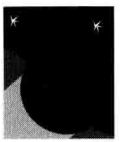

Integrating the Internet for Meaningful Learning

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Preface

This is our second book about learning with technology. We began writing about how technology might be used to enhance content-area instruction nearly seven years ago, and the result was our first book about the general use of technology in classrooms: *Integrating Technology for Meaningful Learning.*

When we wrote the second edition of that book (Grabe & Grabe, 1998), we responded to the growing interest in the Internet as an information resource and communication tool for students. We added a chapter titled "Learning with Internet Tools," and we supplemented our chapter on student projects with material on student web authoring. Yet our experience in working with teachers told us this was simply not enough. The prominence of the Internet in our society; the spending of schools, states, and the federal government on the infrastructure needed to connect schools to the Internet; the learning potential inherent in the Internet—all these demanded a more extensive approach. There is a tremendous need for practical, understandable information about integrating the Internet in K–12 classroom instruction.

THE INTERNET IN EDUCATION

Does the Internet represent a powerful and practical vision for educational improvement? Schools are rushing to provide access to the Internet. Counting the number of "wired" classrooms within schools has become a method for quantifying a commitment to its use. In many venues—research, journals, presentations, daily newspapers—the Internet is held up as a means of achieving educational reform. Internet tools nicely lend themselves to a greater emphasis on student-centered learning, authentic tasks, and performance-based assessment.

Yet, it's important to acknowledge that we've just started on this journey, and we have a long way to go! The opportunities and the promise of the

Internet are very real, but extensive and meaningful use of the Internet to accomplish fundamental educational change is not all that common.

Our purpose in writing this book is to help you understand the vision of the Internet as a vehicle for change on a massive scale—but it is important to do so in ways likely to influence what happens in your classroom. Our objective is to help you see the many roles the Internet can play in education and why so many educators are excited about its potential for teaching and learning. Toward that end, you might want to turn now to Part One, "Why Use the Internet?", which has basic information on "The Internet in Education Today" (Chapter 1), and the nature of student learning in "Meaningful Learning in an Information Age" (Chapter 2). Throughout this text we use examples from classrooms and teachers familiar to anyone who knows "a place called school." We do so as a way to help you understand how ideas about using the Internet in education look in actual practice.

USING THE INTERNET AS A TOOL FOR MEANINGFUL LEARNING

You will note that we frequently refer to *technology as a tool.* This metaphor has been carefully selected because it provides a very important perspective for educators. The value of developing proficiency in the use of any tool is realized only when the tool is applied in accomplishing a meaningful task. Education is partly about helping students acquire skills for the meaningful tasks they must accomplish throughout their lives. However, the use of technology tools does not need to be reserved exclusively for the future. Our emphasis is on the very important work students do in their present daily lives—students must be immediately invested in the productive work of learning. Our intent is to show you how to help students use the Internet to learn the skills and knowledge appropriate to the content area you teach. As you read, you will recognize our focus on three recursive themes. The Internet can provide (1) Tools for Communication, (2) Tools for Inquiry, and (3) Tools for Construction.

THE INTERNET AS A TOOL FOR COMMUNICATION

This first theme focuses on how Internet systems can provide learners with an efficient method for exchanging information and communicating with others. Chapter 3, "Learning with Internet Communication Tools," provides detailed descriptions of e-mail, mailing lists, chat, and videoconferencing systems, along with examples of the types of Internet projects that can be accomplished with these tools.

THE INTERNET AS A TOOL FOR INQUIRY

This theme focuses on how the Internet can provide students with opportunities for seeking the information needed to solve problems. Chapter 4, "Learning with Internet Inquiry Tools," shows how learners can make efficient use of the major Internet tools that promote student inquiry (e.g., the web browser and the World Wide Web). Chapter 5, "Integrating the Internet into Inquiry-Based Projects," builds on Chapter 4 and details the way students can incorporate the Internet into authentic problem-solving projects, and how teachers can develop and structure activities.

THE INTERNET AS A TOOL FOR CONSTRUCTION

This final theme shows the Internet as a vehicle for presenting products students create to summarize a learning activity. Part 3, "Learning by Constructing Internet Resources," focuses on the constructive process of design with chapters on "Constructing Content-Area Web Projects" (Chapter 6) and "Designing Web Pages: Principles for Students and Teachers" (Chapter 7).

In other words, Internet tools can be integrated in classrooms to support some of the most fundamental and essential processes for meaningful learning.

THIS TEXT'S GOALS AND PERSPECTIVE

Our general purpose in writing this book is to aid your classroom practice by bringing together current theory on meaningful learning and the development of critical thinking skills, short tutorials on Internet tools and resources, and a variety of suggestions for classroom activities. Our primary goals are

- To acquaint you with models of meaningful learning, information problem solving, and critical thinking that can establish useful goals for instruction.
- To present the different roles the Internet might play in facilitating meaningful learning, information problem solving, and critical thinking.
- To explain how to use essential Internet tools and resources to accomplish your instructional goals.
- To suggest how you can initiate and facilitate particular categories of classroom activities with your own students, and to demonstrate these possibilities with a variety of classroom examples.
- To promote your thinking and reflection about the best uses of the Internet in your classroom.

What we have to offer is a combination of stimulation, information, and encouragement. That is,

- We hope to stimulate you to think deeply about the processes of teaching and learning. What are the most important educational goals, and what roles do teachers and learners play in accomplishing these goals?
- We will provide you with information that includes concrete descriptions of Internet tools, online information resources, and classroom activities you can use to accomplish your goals. The book should help you answer questions such as: What software will I need, and how does this software work? What should my students and I do with these tools? How have other teachers used such tools and activities in their classrooms?
- Finally, we intend to help you develop the confidence necessary to implement Internet-supported activities in your classroom.

We hope that as you read this book you will not assume that school experiences as you know them must remain fixed, and that technology must somehow fit within this existing framework. Fitting technology and the Internet within existing models of educational practice is certainly possible. However, such a perspective closes off many unique opportunities. Some educators are urging that we drastically revamp our educational system. Criticism of educational practices is not new, of course, and whether massive changes occur, continual scrutiny of educational practices is healthy. We feel that computer technology and the Internet have served as catalysts for the examination of educational goals and methods and, in some cases, have encouraged valuable changes.

As you think about considering classroom applications of the Internet, you will likely find yourself examining broad educational issues. Just remember: in most cases effective teaching with technology is effective teaching by any means.

OUR APPROACH IS ANCHORED IN EVERYDAY CLASSROOM LIFE

We want very much to assure you that what we propose would be practical for you to implement. Our strategy for doing this has been to rely primarily on our own experiences within our local school district.

We decided that it would be unfair for us to piece together a picture of Internet use based on grant-subsidized schools, high-tech demonstration sites, or what we have gleaned about the latest and greatest applications from the conferences we attend and the journals we read. Yes, the theory and research we describe in this book draw on contributions from a wide range of educational researchers and policy advocates. In contrast, however, most of the classroom examples we include come from teachers we know personally.

We both work and live in Grand Forks, North Dakota, and we anticipate that few of our readers have ever visited our community or have more than a

vague notion of where it is located. What might be more relevant is that the technology in our schools is present largely because of the investment of local taxpayers. Thus the applications of technology we describe result from the decision making of the school board, local administrators, and teachers. Our resources for technology are above average: all schools and most classrooms have Ethernet connections to the Internet, and perhaps more important, teachers have access to support personnel assigned to help them use the available technology resources. But how and whether teachers make use of these resources is pretty much up to them. Our district is certainly not at the extremely sophisticated level of a demonstration site.

What we have done in writing this book is draw examples from some of the more involved and creative teachers we know. We do not claim that these teachers are typical, but rather that they work in fairly typical schools under typical conditions. For them the Internet is a valuable tool, and it contributes to practical and productive activities for their students.

THE AUTHORS' COMPLEMENTARY EXPERIENCES

A few comments about our own backgrounds may provide a context for what we emphasize. The topics and theoretical perspective of this book result from a blend of the orientations, experiences, and individual interests of the two authors.

Mark Grabe's background is in educational psychology—he is a professor in the Psychology Department and the Instructional Design and Technology program at the University of North Dakota. He brings to this collaboration the theoretical perspectives and research experiences more typical of a university faculty member. Mark has been developing instructional software for approximately fourteen years in support of his own research activities. Originally trained to teach high school biology, he continues to pursue his interest in science education. Some of his first Internet activities involved designing instructional web sites to promote the outdoor educational programs of the North Dakota Department of Game and Fish. This work, which you will catch glimpses of throughout the book, has encouraged an interest in hands-on science and the role technology might play in it.

Cindy Grabe's original certification was as an elementary teacher; she later earned a master's degree as a learning disabilities specialist. After she had worked for many years as a reading specialist, her interest and experience in using technology in instruction led her to a full-time technology position with the Grand Forks, North Dakota, school district. She has been a technology facilitator, a position that in some districts may be described as a computer coordinator, for nine years. Her position requires that she provide training to district teachers, administrators, and staff members, collaborate

on curriculum projects, and conduct demonstration activities with students. She is involved in providing continuing educational experiences for teachers in area schools, and she teaches courses for preservice teachers. Cindy deals directly and continuously with the very practical issues of integrating the Internet in classrooms. Her own work with students and her association with many gifted classroom teachers are responsible for most of the classroom examples we provide in this book. Cindy has been recognized as an Apple Distinguished Educator by the Apple Computer Corporation.

LEARNING FEATURES OF THE TEXT

Embedded in the chapter content are special features to help you better understand important concepts and use them in your own classroom.

SOURCES IN REAL CLASSROOMS: STORIES, PROJECTS, INTERVIEWS

Descriptions of actual classroom events can provide a powerful way to "see" in action many of the ideas we present. *Stories* of classroom events and descriptions of actual student *projects* are embedded in many chapters as demonstrations of teacher or student behavior. We have also included some *interviews* we conducted with people who work directly with teachers or students.

We have tried to remain true to the comments of the professionals we interviewed and to the stories that teachers and students actually related to us. In a few cases, such accuracy required that we include statements that are not in perfect agreement with suggestions we ourselves might make. We assume you understand that this is a field in which diverse and sometimes contradictory opinions exist.

SCREEN IMAGES AND PROGRAM EXAMPLES

The graphics in this book are mostly images captured as they appear on the computer monitor. You may not always have immediate access to the computer tools or the Internet resources we describe, so these images are a convenient way to help you understand what the text explains. Visual examples are one of the best ways to explain topics such as web page design and to present samples from actual student projects.

"FOCUS" AND "KEEPING CURRENT" FEATURES

The features that appear under the general titles "Focus" and "Keeping Current" allow us to break away from the main thrust of a presentation and con-

sider a topic in more detail. The topic might involve a deeper explanation of how a particular software program or form of technology works; an extended discussion of an important issue or theory; or the presentation of an instructional strategy. Setting these discussions apart allows the reader to consider the topics independently from the main discussion. If we were presenting this material using hypermedia, we could use some great techniques for linking the central ideas to interesting details. A book is not hypermedia, but these features are the next best thing.

ACTIVITIES

Following the text of each chapter, we include several activities that we suggest you try. These activities are our attempt to get you to think more actively about important issues presented in the chapters. We have attempted to generate activities that can be accomplished either with or without direct access to computer resources, so you should be able to complete most of the brief tasks we propose. We believe that reading about the application of the Internet will not be enough to prepare you to use the ideas in your classroom. We trust that this book will not be the only resource at your disposal and that you will also learn a great deal from teachers and colleagues.

RESOURCES TO EXPAND YOUR KNOWLEDGE BASE

Each chapter ends with annotated lists of resources that offer further information about the topics and software tools covered in the chapter. Although we include resources of different types, we have decided to emphasize web sites. We feel that carefully selected web sites will provide you with the most immediate and current access to software information and examples of Internet applications—and increasingly to scholarly information as well.

Listing web sites has one limitation: web addresses may change or disappear. Our solution is to host our own web site so that you can keep up on changes that come to our attention. Please visit us at **http://ndwild.psych.und.nodak.edu/book** or connect to our site via the main Houghton Mifflin web page (**http://www.hmco.com/college** and select "Education"). From there you should be able to locate current resources related to this book.

Most of the Internet addresses from the text have also been collected in the "Teachers' Handy Reference" at the end of the book. We hope that you find this collection to be a valuable resource.

ACKNOWLEDGMENTS

A book is a great example of a cooperative project. The authors get to put *their* names on the front cover, but many people make essential contributions. We

owe many individuals our gratitude for helping to bring you this book. Loretta Wolozin, senior sponsoring editor at Houghton Mifflin, saw in the proposal for our first book the germ of a unique idea and made the trip to North Dakota to talk with us and examine student projects. Focusing on the curriculum and putting students in control of powerful tools were not typical themes at the time we began writing about technology, yet Loretta supported our belief that these themes should be at the core of what teachers learn about the classroom applications of technology. She has continued to support these themes as we have turned our attention to the Internet.

Doug Gordon was the developmental editor on this project. His patience and skill were very helpful as we explored the structure for this book and the way our ideas would be presented. Doug is very knowledgeable in the general area of technology, and several topics and resources were added at his suggestion. Most of all, he has a great way of shaping prose so that it reads easily. We hope you will find our arguments and explanations clear and our style friendly.

Aileen Mason, our project editor, was responsible for the tedious task of putting the finishing touches on this book. The more we learn about design, the more we appreciate that structure and presentation make important contributions to what a learner gains from any medium. Aileen also handled many details such as making certain there is a citation for each of our references—details that the reader takes for granted and that writers are never quite careful enough to guarantee.

Other people from Houghton Mifflin also made an important contribution to this project. Lisa Mafrici, our point of contact with Houghton Mifflin throughout the project, kept us aware of our responsibilities as different stages unfolded. Betsy Peterson from the Houghton Mifflin legal department provided valuable information relevant to our comments on fair use and copyright issues in Chapter 9. Houghton Mifflin was one of the publishing companies involved in the Conference on Fair Use that established some of the guidelines we discuss in that chapter.

Finally, we owe a giant debt to the many students, administrators, and teachers who provided the authentic examples and interviews we have included to ground the ideas of this book in real schools and classrooms. The individuals identified throughout this book represent a wider circle of people who have influenced our thinking about teaching and instructional applications of technology. Thanks to all who have allowed us to draw on their creativity and experience.

Brief Contents

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