Preface

Technology is embarking on a new phase in the classrooms of the future. Gone are the days when teachers were forced to rely on technologists to prepare their instructional materials. At the outset of the technology revolution, computers and software were so technically complex that only programmers dared tackle the design, development, and implementation of a   computer-assisted instruction package.

The use of microcomputers in the classroom expanded rapidly during 1980–1989. During this decade, U.S. schools acquired over two million microcomputers, and the number of schools owning computers increased to virtually 100% (Kinnaman, 1995). Even so, creating early technology-based materials demanded the use of a limited array of available design tools, such as BASIC programming language and application software such as LOGO. Preparing instructional materials remained under the purview of the technologist who understood the dialects of programming code and machine language. Fortunately, the rapid evolution of multimedia technology, both hardware and software, in the mid-1990s changed all that.

Between 1978 and 1995, prior to the advent of multimedia technology, computer processor speeds increased from 4.77 MHz (megahertz) to a phenomenal 166 MHz, a whopping factor of 40. From 1995 to 2002, multimedia-capable systems increased again from 200 MHz to speeds greater than 1 GHz (gigahertz), another factor of 5. Respectively, computer memory would advance from 16 kilobytes in the late 1970s, to megabytes in the 1990s, and now gigabytes in the new millennium. During

the same periods of time, software tools and applications also exploded in capacity and capability. Spreadsheets and word processing were introduced in 1979. It would be 1987 before hypermedia was introduced, and several more years before office productivity and Web browsers could match the available speed and memory capacity of multimedia computers.

After decades of instructional technology advancements in speed, memory capacity, and software, teachers finally have at their disposal user-friendly applications that support the design and implementation of sophisticated instructional materials matching individual teaching strategies with curricular lesson objectives and student learning styles. Now, all teachers need is a comprehensive, easy-to-understand, resource to guide them through the expanding maze of Web sites and educational software. Enter *Teaching with Technology Across the Curriculum*.

This book is for educators who consider technology a viable content area in its own right and an essential tool for lifelong learning. It focuses on integrating technology into P–12 (Preschool through Grade 12) curriculum using computers, software, and the Internet to deliver academic content.

The book begins by examining how to create technology-based instruction for the classroom. The first two chapters set the stage by introducing instructional technology and how teachers create and infuse that technology into their curriculum. Readers are asked to identify their own system of beliefs about learning as they begin this book. It is important to determine which psychology of education best represents their views of teaching and learning and how that preference influences their use of technology in the classroom. The Model for Preparing Technology-Based Lessons serves to guide the reader in the design, research, development, implementation, and assessment of technology-based resources. And, a new technology classification paradigm offers a novel way of thinking about technology-based student learning.

In Chapter 2, word processing, spreadsheets, databases, graphics utilities, multimedia, and the World Wide Web are established within their historical context. Each application is explained in terms of potential use in the classroom. Standards for each content area are offered for primary, intermediate, middle, and secondary grade levels. Finally, example lesson plan ideas are suggested so that the reader may consider practical

lesson goals and objectives for technology-based instructional materials.

The book focuses on infusing technology-based academic content materials into the P–12 curriculums. Chapters 3 through 10 introduce instructional technology in light of real-world classroom situations in eight key academic areas: Science, Mathematics, Social Studies, Language Arts, Fine Arts, Foreign Languages, Technology, and Special Education. Each chapter is similarly constructed, addressing critical elements in the use of technology. Specifically, each chapter deals with appropriate technologies for the classroom, including a short history of how technology has affected the area in the recent past; technology standards for teachers and students, as proposed or accepted by national and international associations particular to each area; the best in electronic media, including commercially available, shared, and free educational software at appropriate K–12 grade levels; exciting sites on the World Wide Web, offered by academic area and grade level; and integrating technology into classroom-appropriate thematic units, which will offer the reader actual thematic lessons that have successfully integrated technology.

The final chapter offers a look at how classroom teachers utilize the competencies, content ideas, and practical examples offered in the previous chapters to design, develop, and implement their own, teacher-made technology-based instructional materials. It guides the reader toward the integration of text-based, visual-based, and Web-based instructional materials into the curriculum. For those readers ready to prepare their own materials, Chapter 11 provides a step-by-step primer for creating word-processing documents, classroom presentations, and Web-based home pages. The appendices that follow the chapter offer example materials with links to an innovative Web page designed specifically for readers of *Teaching with Technology Across the Curriculum*. Teachers are encouraged to retrieve the Microsoft *Word* documents, *Power Point* presentations, and Netscape Web pages at www.duq.edu/~tomei/TAC (*Teaching Across the Curriculum*), where the online files may be downloaded for practice while reading the chapter.

Renowned educators, steeped in the methodologies for teaching the key academic areas, have prepared these chapters. The content, evaluations, rubrics, and example software packages and Internet sites have been accumulated, reviewed, and assessed over the course of several academic semesters. Technology is more than a delivery system, and *Teaching With*

Technology Across the Curriculum offers many practical uses to simulate real-world environments and replicate authentic problems. The guiding light during the preparation of this book was a hope that readers would incorporate aspects of the book as they see fit for the expressed purpose of using technology to promote student understanding and improve student learning.

Reference

Kinnaman, D. E., & Dyrli, O. E. (1995). Teaching Effectively with Technology: What Every Teacher Needs to Know About Technology. *Technology & Learning Magazine*.