Over the past six years, the AICTE series has introduced a number of instructional pedagogies steeped in technology and dedicated to furthering the study of teaching and learning with technology and its practical applications in the classroom.

Welcome to Volume 7, *Learning Tools and Teaching Approaches through Information and Communication Technology Advancements*, in the Advances in Information and Communication Technology Education (AICTE) Series.

**THE AICTE SERIES (VOLUMES 1 THROUGH 6): A RECAP OF PREVIOUS EDITIONS**

**Focus Areas.** In the inaugural Volume 1, *Integrating Information and Communications Technologies into the Classroom*, published in 2007, we addressed the multiple perspectives of teaching and learning with technology and promoting research efforts, positions, and practices advancing the state-of-the-art application of technology in formal education, corporate training, higher education, professional development, and proprietary education. Volume 1 focused on contributions from many disciplines of educational and instructional technology and discussed specific focus areas of: business, computer science, and information technology, distance learning technology education, communications technologies employed in the classroom, and technology as a teaching strategy and learning style.

**Models for Effective Education.** *Adapting Information and Communication for Effective Education*, Volume 2 (2008), introduced a series of models for consideration that included the Teacher (Teach-Understand-Integrate) model for faculty development; the Blended ICT Model for higher education; the Knowledge-Application-Research-Practice-Evaluation (KARPE) model for differentiating teaching and learning with technology; the Analysis-Design-Development-Implementation-Evaluation (ADDIE) model as applied to online instruction; and the Training-Attitude-Knowledge-Skills (TRAKS) model for technology training in organizations.

**Tools.** Volume 3 (2009) offered the reader a look at research pertaining to design, development, and collaborative tools. In *Enhanced Education and Learning: Advanced Applications and Developments*, design tools offered in the first section were subdivided into theory and practice. The theory-based tools discussed gender bias in science, technology, engineering, and mathematics, as well as the technology acceptance model. From a practice-based perspective, issues of didactic teaching, e-pedagogy, teaching practices, and agent-oriented design were introduced, each with a bent toward best practices of teaching and learning. The second section focused on development tools; specifically, classroom and staff training,
including innovative graphics presentation software, the design of staff and faculty training environments, and techniques used to optimize student learning. The third and final section explored collaborative tools: asynchronous and synchronous tools employed to foster teaching and learning with technology.

**Instructional challenges.** *ICTs for Modern Educational and Instructional Advancement: New Approaches to Teaching*, Volume 4 (2010), examined some of the instructional challenges that have inspired faculty improvements in lesson delivery using new and familiar technologies. A host of approaches (i.e., new for 2010) included online postings, exemplary educational technologies, design principles for 21st-century educational technology, evaluating educational technologies, multimedia into classroom technologies, learning management systems, online learning communities, emerging educational technologies, and a look at the classroom of the future. Together, this edition of the AICTE series set the stage for an evolution in teaching by introducing teachers to the theories, principles, and applications of blended learning.

The Engine for Technology-Based Teaching proposed a new model of Instructional System Design (ISD) for developing effective technology-based education that involves a five-step process focusing on the learner, learning theories, resources, delivery modalities, and outcomes. In Volume 5, *Online Courses and ICT in Education: Emerging Practices and Applications*, the 2011 edition of the on-going AICTE series established a taxonomy of its contributions subsumed under each of the five components of the engine, sharing key manuscripts published under each cog of the engine. From a general discussion of factors that influence whether students take online courses to a consideration of gender differences with respect to technology, the contributing authors provided their readers with excellent reflections pertaining to all aspects of teaching and learning in an online education environment.

**A New Equation for Learning.** Last year’s Volume 6 (2012), *Advancing Education with Information Communication Technologies: Facilitating New Trends*, introduced the new equation, Teaching + Learning = Pedagogy + Technology. The text was presented as two books in one. First, it was an examination of how teaching and learning had been advanced in the previous millennium and how it is likely to evolve into the 21st century. Second, this work offered its readers a look at how new trends in pedagogy and technology have been influenced by recent advances in information and communications. In it, readers explored the fundamentals of teaching and learning on one side of the new equation and key pedagogies and technologies on the other. The equation provided an organizational tool (i.e., an advanced organizer) for discussions throughout the remainder of the book.

**THE AICTE SERIES (VOLUME 7)**

Since the AICTE series began, only a few short years ago, over 2,000 tools for learning have been conceived, pioneered, and launched in education and the workplace. The number of teaching approaches, likewise, has expanded geometrically over recent decades.

Volume 7 returns our attention to teaching and learning and the pedagogy of instructional technology. In this edition, *Learning Tools and Teaching Approaches*, readers of the AICTE series will find this text a welcome addition to their collection of tips and techniques for using technology in the classroom. Educational researchers, scholars, and practitioners share their most current investigations and best practices surrounding the uses of technology in the classroom.
Learning Tools

Leaders in the discipline have attempted to categorize technologies using many different schemas. Richard Culatta (2009) offered a classification design based on the manner of interaction found in the learning experience. Learner →← Expert technologies, for example, connect learners to authorities in subject matter content using synchronous and asynchronous technologies, such as online learning communities, learning management systems, and mobile learning devices. Learner →← Learner technologies are similar in scope to the previous category, in this case linking two or more students using parallel technologies. Learner →← Content interactions make content available to learners via one-way technologies such as streaming video and podcasts and two-technologies such as social networking tools. The final category, Learner →← Context, utilizes the part of a technological environment that surrounds the particular learning objective or task to help determine its meaning. Technology-based learning tools can assist in this pedagogical pursuit employing, for example, educational software and 21st century apps.

Learner →← Expert Technologies. Many of the most popular learning tools are included in this text and representing all four of the classification designs described above. In the initial category of Learner →← Expert, the first three chapters describe tools used by experts (i.e., teachers).

Chapter 1, “Pre-Service Teachers and Technology Integration with Smart Boards,” by Keengwe and Oigara, explores pre-service teachers’ experiences integrating SMART Board technology into their practice. Their findings pertain to teacher mentoring, pre-service programs, and technology integration, and are important for educators seeking to develop better curriculum aimed at preparing teachers to successfully integrate appropriate educational technologies into classroom instruction. Of particular interest to readers will be the specific use of SMART board technology.

Chapter 2 evaluates the effectiveness of teaching academic content (specifically, pattermaking in this study) via computer, comparing the outcomes of a lesson taught in a traditional lecture style to that received via a computer-based animation program. “Using Animated Graphics as a Teaching Tool in Patternmaking: A Comparison of Methods” (Boorady, Hawley, and Schofield) found a significant difference in learning outcomes between the lowest and more experienced groups; however, they found no difference in the outcomes between two more experienced groups. Readers should examine the criteria considered when measuring learning outcomes and the thresholds employed by the authors to establish “significant differences.” There are many educational applications where this study can provide a solid methodology for further research.

In “Enhance Student Learning with PowerPoint Games: Using Twenty Questions to Promote Active Learning in Managerial Accounting,” by Fratto, Chapter 3 considers the discipline of accounting and how educators can realize a significant increase in learning outcomes by providing active learning opportunities: specifically, the integration of creative applications of technology into the curriculum with an emphasis on learning by doing. The chapter describes the use and development of a PowerPoint game (a true Learner →← Expert application) in an introductory accounting course. The author describes offering students in her class immediate feedback designed to be accessed outside of the classroom. Readers will appreciate how this technological tool can be used in other undergraduate academic disciplines.

Learner →← Learner Technologies. The second category of learning technologies promotes educational collaboration that ultimately encourages personal growth and lifelong learning. Volume 7 offers two chapters that demonstrate how groups and team teaching foster an increase in student learning outcomes.
Chapter 4, “Forming Groups for Collaborative Learning of Introductory Computer Programming Based on Students’ Programming Skills and Learning Styles” (Adán-Coello, Tobar, de Faria, de Menezes, and de Freitas), examines the effectiveness of collaborative learning as a technology-rich approach towards reducing learning obstacles that arise during the process of teaching complex content: in this case, computer programming. The chapter considers the collaborative learning process as a fundamental learning activity. It discusses criteria associated with successful and unsuccessful applications of student groups. Readers interested in collaborative learning groups should examine the characteristics of the two packages reviewed in this study. One package grouped students with significant differences in programming style, while the second package expanded the first grouping to consider individual student learning styles. The findings from two experiments are presented for consideration.

“Team Teaching in the Online Graduate Environment: Collaborative Instruction,” by Fuller and Bail, examines a history of team teaching and its positive benefits for learners and teachers in a variety of educational settings. In Chapter 5, the authors’ action research model describes the outcomes of team teaching an online graduate-level course with geographically separated instructors as well as learners. Data consisted of reflective instructor logs and student responses to the team teaching model. Results indicate a positive benefit in content and pedagogy as well as continued learning on the part of each instructor. Students also reported greater instructor presence and a greater understanding of the research and statistical process through immediate feedback and increased access that resulted from the team teaching process.

Learner →← Content Technologies. Mathematical and technological knowledge, medical education, design education, nutrition information, and fashion production represent academic subject matter areas enhanced by learner-content technologies.

“Exploring the Co-Development of Mathematical and Technological Knowledge among African American Students” (Nzuki) examines students’ interactions with the graphing calculator as a tool to support mathematical learning. Chapter 6 provides an account of two African American participants presented with a task-based interview and their learning strategies using graphing calculators as their content technology. Their examination of a cited framework for studying the various ways students work and interact with technology is particularly enlightening to readers. As with most content-oriented technologies, it is the ability of the instructor to develop an interactive relationship between mathematical and technological knowledge that results in successful student learning.

Chapter 7, “Simulation Followed by a Reflection and Feedback Session in Medical Education,” by Kumalasari, Caplow, and Fearing, examines surgical residents’ perception of their learning after participation in a simulation followed by a reflection and feedback session. Readers interested in content technologies will find the study of eight first-year surgical residents fascinating. Results indicated that medical learners were successful in connecting prior knowledge and practical clinical experiences using the simulation technology and online feedback. Participants in the study indicated that they were able to learn new strategies to address these complexities and distractions and improve teamwork for future, similar situations aligning closely with the expressed purpose of content technologies.

Chapter 8, “Computer Technology: An Essential Component for Teaching a Fashion Production Management Course” (Lin), focuses on faculty and students in a fashion production course integrating technology to design, manufacture, manage, and market fashion products. Students remained responsible for the project from start to finish while specific computer software programs were tapped to facilitate the product development process taught in the classroom. Other applications of computer technology
were introduced into student projects. Based on positive student evaluations and profitable sales, the course was highly rated with tips and techniques for readers to consider. Siu and Wong relate a historical review of the development of design education and the technological literacy that goes along with this academic area. “Changes in the Technological Aspects and Facilities of Design Education: A Case Study of Hong Kong,” Chapter 9, shares a number of historical events along with the development of the economy, industry, and society, and establishes how fundamental design education is to understanding technology for children and young adults.

The final academic discipline to be discussed under the heading of content technologies is nutrition. In Chapter 10, by Larsen and Martey, the authors offer their research, “Adolescents Seeking Nutrition Information: Motivations, Sources, and the Role of the Internet,” exploring the potential of the World Wide Web to provide effective nutrition information to learners. Their study investigates the specific reasons adolescents do and do not use the Internet to learn about nutrition. They reflect on the factors that motivate young learners to opt for online searches and medical websites over more traditional sources of information. Readers of this text will be exposed to the authors’ use of in-depth interviews and an online survey to examine two stages of the information-seeking process: initiation and selection. Results reveal that the Internet is not always the preferred medium for learning because adolescents tend to use technology primarily for social rather than formal tasks.

Learner →← Context Technologies. Context technology offers a twenty-first century environment for determining and clarifying the meaning of new knowledge by providing virtual surroundings or simulated settings that may not otherwise be available to the learner or the teacher. In this volume of the AICTE Series, six authors contributed to the literature with reviews and research addressing this final classification of learning tools.

“The Application of Web and Educational Technologies in Supporting Web-Enabled Self-Regulated Learning in Different Computing Course Orientations,” by Tsai and Shen, examines the effectiveness of online courses compared to the face-to-face classroom format. The authors of Chapter 11 redesigned two courses and conducted a quasi-experiment to examine the effects of the two modalities on students’ computing skills. Readers will find that the results of the study have application to many technology-based courses. Students who received the technology intervention achieved significantly higher grades than those who did not. The reliability of the study was further authenticated when students in the two different courses produced very similar scores.

Chapter 12, “Faculty-Faculty Interactions in Online Learning Environments” (Kyei-Blankson and Keengwe), engages a mixed research method design to investigate learning management system resources available to faculty. In a textbook example of the learner-context model, the study explores the nature of peer interactions among faculty who taught or planned to teach online courses looking for the benefits and challenges involved in initiating and maintaining such interactions. Readers will find their results appropriate for their own technology preparation and support program development and implementation.

“Mobile Learning in Organizations: Lessons Learned from Two Case Studies” (Saccol, Barbosa, Schlemmer, and Reinhard) establishes mobile learning from a K-12 to higher education perspective. This study contributes to the literature by examining m-learning experiences in the corporate environment. The technologies they consider include COMTEXT® (a Mobile Virtual Learning Environment [MVLE] developed by the authors) and others. Chapter 13 discusses the various elements involved in m-learning practices in a corporate training environment including ergonomics, technological and pedagogical affordances, limitations of mobile and wireless technology, methodologies and learning tools (most appropriate for this text), and the different types of mobility involved in successful m-learning activities.
Todorova and Mills, Chapter 14, propose a learning model aimed at “Using Online Learning Systems to Improve Student Performance: Leveraging Prior Knowledge.” Enriching, assessing, and activating prior knowledge is a noble goal for all educators as they seek to help students acquire the knowledge and skill set needed to make decisions and solve real-life problems. The premise behind learner-context technologies is the very combination of art and science that enables meaningful student learning. This chapter provides a preliminary evaluation of the feasibility of using an online learning system to promote and enhance student performance. The results show positive changes in student study behavior, motivation, classroom experience, and learning outcomes. Opportunities for readers to produce similar results in their own online classrooms merit its consideration.

“An Online Learning Community Integrated with Web-Enhanced Collaborative Learning and Self-Regulated Learning” (Tsai) investigates the growing trend towards collaborative learning as a context technology in higher education. Chapter 15 examines student computing skills in a blended learning environment, another common tool found in the growing inventory of context-rich technologies. The author redesigned a course and adopted these Web-enhanced tools to foster undergraduate computing skills in a Web page programming and website building course. The results showed that students benefited with higher grades. Readers should consider the premises and techniques offered in this chapter when designing online or blended courses for their own students in pursuit of better learning outcomes.

Teaching Approaches

The second part of Volume V7, Learning Tools and Teaching Approaches, includes fifteen chapters that focus on teaching approaches. From the literature, eight methodologies surface with respect to instructional technology (Woodrow, Mayer-Smith, & Erminia, 2000; Mehlinger & Powers, 2002; Drazdowski, Holodick, & Scappaticci, 1998).

1. Unique applications of technology in education
2. Applications distinctive to K-12 education
3. Applications distinctive to colleges, universities, and higher education
4. Technology integrated into the design of teaching and learning
5. Idiosyncrasies of distance education as a teaching approach
6. Integration of technology in a teacher education program
7. Assessing technology-enhanced instruction
8. Issues of globalization and technology

Some offer multiple chapters, others present fewer examples. However, the methodologies offered here suggest an excellent taxonomy for readers to categorize their further literature reviews.

Unique Applications of Technology in Education represents a generic body of teaching approaches that address specific, exceptional, distinctive student needs. Technology attributes have always included three defining characteristics that make technology appropriate for any application: speed, accuracy, and repetitiveness. These same features have made technology a successful partner in the teaching-learning process.

Chapter 16, “An Information System for Coping with Student Dropout” (Aflalo and Gabay), studies the student dropout predicament common to all countries and every known educational system. The authors examine ways to apply technology to cope with the problem by examining a research population
that included 418 educators who deal with the dropout problem as a part of their responsibilities. An experimental group performed their work using the target information system; a control group continued to use traditional means. Readers will find that the information system improved the information collected for students at risk and resulted in an increase in the number of student interventions. As a result, the study noted a decrease in the dropout rate over a period of three years—valuable results for everyone involved in enrolling and retaining students.

“An Effective Conceptual Multisensory Multimedia Model to Support Dyslexic Children in Learning” (Sidhu and Manzura) offers the reader an uncommon look at an all too familiar childhood learning challenge: dyslexia. Chapter 17 surveys a courseware development model specifically for dyslexic children involving five essential features, namely: interaction, activities, background color customization, directional (left-right) text reading identification, and detailed instructions. The evaluation showed positive results in performance of the learners.

Applications Distinctive to K-12 Education. Elementary and secondary education students must master information and technology resources if they are to effectively enter the world of work. We have become an increasingly complex and technology-based society. Readers of this text will be introduced to one country’s efforts to connect their schools with the overarching goal of implementing an ICT instructional program to make all students independent, competent, responsible, and confident users of information and technology.

“ICT, Enterprise Education, and Intercultural Learning” (Austin) reports on a school-based enterprise initiative involving both primary and secondary school teachers working across an international frontier. The main findings reported in Chapter 18 show that when technology was used to connect schools, it fostered a wider range of skills. In primary schools, communication tools and strong collaborative learning were enhanced. In secondary schools, links were made between a range of business studies courses. The evidence suggests that when students were working closely in teams across national boundaries, they developed a wide range of interpersonal skills important in the real world.

Applications Distinctive to Colleges, Universities, and Higher Education uncovers technology issues related to teaching and learning in this particular venue. Since technology was introduced on campuses back in the 1960s, it has and will continue to have a marked impact on teaching adults. Higher education is a fertile environment for exploring the importance of technology on learners, including young to old, post-secondary to doctoral, technical to professional. Most educators in both the public and private sectors agree that technological innovation will continue to have a major influence on teaching methodologies in the future. The chapters that follow examine some of the tactical as well as strategic perspectives of technology’s evolution in colleges and universities.

As reported in Chapter 19 by Semich and Ray, current indications from the literature agree that distance learning in general, and online learning specifically, will continue to expand into the foreseeable future. For those readers who are familiar with the premise of Ray Kurzweil (1999), his proponents would probably agree that we have shifted from an arithmetic increase in the popularity and magnitude of online courses to the inevitable geometric increase in growth. “Choosing a Path for Doctoral Studies in Educational Leadership: A Look at the Online Format” examines the trends as they pertain to completely online doctoral programs. The focus of their study was to examine the perceptions of doctoral students at one institution toward the online format. The findings indicated a less than favorable bias towards a completely online format. However, readers should review the support given by participants of the study to a hybrid model for the program.
Chapter 20, “Culturally Different Learning Styles in Online Learning Environments: A Case of Nigerian University Students” (Adeoye) addresses how learning styles interact with receptivity to online teaching modalities in different cultures. The author examines and analyzes online learning environments in terms of differences in the learning styles of his particular country’s higher education learner. Cultural backgrounds, programs of study, and other factors are examined with respect to how they affect successful online learning and how students respond to an online learning environment. Readers of this text who are online instructors will appreciate the learning activities described and the learning styles presented. Ethnicity and cultural diversity are relatively new aspects of teaching with technology that need to be considered in the design of online instruction.

Technology Integrated into the Design of Teaching and Learning. For readers of the AICTE series, arguments regarding whether the use of technology in the school curriculum has improved the quality of teaching and learning should be moot. However, the variety of ways in which technology is integrated into the teaching-learning process certainly remains open for further study. Student interaction with technology does not always produce an increase in student learning outcomes, nor is it always beneficial to student growth. Designing technology-rich instruction continues to mature as both an art and a science.

Measuring the effective integration of technology into teaching and learning began with the introduction of the first Apple II computer in the late 1970s. It remains at a less than ideal level for most technology-based classroom applications. Educators continue to seek more learner-centered design models for learning-supported integration. Research has shown that the use of technology in education improves student achievement. It motivates students while providing them with avenues for higher-level thinking. The art of designing successful instruction is the aspiration of the following chapters.

Jared Keengwe and Onchwari review the constructivist pedagogical framework and the critical issues related to technology integration in schools. Chapter 21 advocates the need for teachers to embrace constructivist teaching strategies to enhance meaningful teaching and learning in the design of technology-rich classrooms. “Fostering Meaningful Student Learning through Constructivist Pedagogy and Technology Integration” recognizes several contemporary problems associated with designing with technology. The first such predicament is that many teachers find that increasingly improved (and complex) tools are beyond their personal capabilities. They have not been professionally prepared to successfully integrate these tools into instruction in ways that maximize student learning outcomes. Second, many teachers entering the workforce are far more likely to use computers for personal purposes rather than in the classroom. The authors suggest several reasons why this may be occurring and how best to address the issue. Regardless of the reason or its causes, the chapter purports the need to motivate, train, and equip teachers with the skills, knowledge, and pedagogical framework to effectively teach with technology tools.

Chapter 22, “User Interface Design Pedagogy: A Constructionist Approach” (Khoo) describes an Internet-based interactive case scenario that was developed to teach students the concepts of user interface design. Using a constructionist (cognitivist) approach, the case study was developed to promote a sense of “experience” for students, encouraging them to “construct” their knowledge of interfaces so that they can better understand and remember. Readers will appreciate how the author addresses an important educational psychology (constructivism) and links it effectively to the use of technology.

In “Reexamining Relative Advantage and Perceived Usefulness: An Empirical Study,” Wang, Meister, and Wang consider two concepts they suggest are critical to the adoption of existing technologies and the consideration of new technology. Relative advantage and perceived usefulness are examined by empirically testing a model that explores the roles of these constructs in explaining and predicting the adoption of a new technology in light of existing ones. The results offered in Chapter 23 suggest that
perceived usefulness and relative advantage are related but distinct constructs with implications that help readers better apply these constructs in research when considering ICT strategies.

**Idiosyncrasies of Distance Education as a Teaching Approach.** Distance education encompasses any modality of instruction in which the learner is geographically separated from the teacher. However, an addition to the definition here also causes us to examine what happens when co-instructors are separated, as well as their students. Distance education has taken its rightful place alongside the other primary modalities of teaching: traditional (face-to-face) and hybrid (a combination of classroom and virtual instruction).

The key elements of teaching remain the same: delivery of instruction, advice and counseling, and assessment are critical components that may be modified by the use of technology. However, they must occur if learning outcomes are to be achieved, as is often the case of a virtual learning environment, via two-way communication.

Distance education has been available for at least the last 100 years, manifesting itself in some capacity as an alternative method for delivering academic content to learners unable to attend traditional classes. The United States military was arguably the first major institution to embrace distance education back in its formative days when such modalities were limited primarily to correspondence courses. Later, the applications of computer-assisted instruction gave online learning its first practical test—producing great successes as thousands of military received technical training via this venue over the ensuing years.

Various forms of technology have been developed specifically to aid in the transfer of knowledge from expert to learner. Video, audio, computer conferencing, and computer-based applications were present at the threshold of distance education; social networking and virtual applications are the latest in the technology-based tools for learning. Synchronous and asynchronous learning now offer real-time sharing of instruction or opportunities for students to learn independently, separated from their peers and teacher by time and space.

**Chapter 24** begins an examination of the latest research devoted to distance education. In Barter’s “Rural Schools and Distance Education,” the author shares a compilation of her research over a number of years focusing on current issues in rural education. Teachers recount actual classroom narratives, surfacing issues that include an inability to retain teachers, too little diversity in student programming, and a lack of access to extra-curricular activities. The author also brings to light the promises of distance education. The chapter discusses teacher experiences with distance education and the use of delivery technologies in support of the teaching-learning process. Teachers, it is reported, enthusiastically support distance education in rural communities.

**Chapter 25** by Kirby and Sharpe offers an excellent addition to the research literature with their study on the “Intention, Transition, Retention: Examining High School Distance E-Learners’ Participation in Post-Secondary Education.” The authors examine student transitions to post-secondary education and the impact of online courses on their evolutionary experiences. Their review involves a multi-year study of high school online learners and finds that online courses in high school are not a significant factor in the post-secondary education transition process, whereas student academic achievement remains consistently influential.

**Integration of Technology in a Teacher Education Program.** There has been much written in the research literature regarding efforts to improve teacher education programs. With few exceptions, the research studies have attempted to assess the success of college teacher preparation programs in grooming future teachers in their use of classroom technology. Colleges and universities have been forced to
train their faculty in these applications either alone or in small consortia of similarly sized institutions. The research efforts of two contributors to this text examine the process for preparing new teachers with the skills to select and use instructional technology effectively. These research studies support the work of institutions in their efforts to look critically and systematically at how they prepare their classroom faculty to teaching in today’s higher education classroom.

**Chapter 26.** “Asynchronous Learning and Faculty Development: Evolving College-Level Online Instruction and Empowered Learning” (Benton), studies higher education faculty experiences with course content adaptation, methodological changes, and program assessment for creating online learning environments. Using journaling, student responses, and interviews, the study yields consistent results regarding the need for further faculty development of these skills. Readers will be presented with successful online classroom practices, a number of problems, and recommendations.

“Adapting a Face-to-Face Competence Framework for Digital Competence Assessment (Torres-Coronas and Vidal-Blasco) reveals the design of a Web-based learning experience that developed both digital competencies and management knowledge. **Chapter 27** argues that higher education academics should continue to expand the awareness of such applications and the role they can play in optimizing learning and knowledge creation among students.

**Assessing Technology-Enhanced Instruction.** Educators have moved beyond the impediments of limited research pertaining to technology-based education. Many are ardent proponents, relying on the de facto status that has embraced technology as an effective instructional strategy. Still, more advanced research continues to be sought out by the community that promotes technology for teaching and learning, most notably in the area of assessment and evaluation of instructional outcomes. In the chapters that follow, AICTE authors and contributors share findings regarding assessments that add to the body of literature so important to our readers. For some, technology-based delivery modes can be as effective, in some cases even more effective, than traditional instructional methods. Here are two investigations for your consideration.

Strang offers our readers **Chapter 28**, “E-Learning Effectiveness in a Quantitative Course: Theoretical vs. Industry-Related Discussion and Exam Questions.” His study compares the effectiveness of discussion question types on exam scores using correlation, ANOVA, and MANCOVA models to test whether real-world (versus theoretical) questions focusing on industry examples would increase discussion interaction volume and, ultimately, exam scores. Statistically significant results were found.

**Issues of Globalization and Technology.** Arguably, technology’s most honorable purpose is to bring about a better world, offering contributions that benefit all societies. Historically, technology has enabled nations to participate in the global economy, offering goods and services to some and increasing the standard of living for all. Globalization via technology still relies on the imperative of increased international cooperation. The studies presented here offer the reader new perspectives of the issues surrounding this final teaching approach.

“Bridging of Digital Divide in Africa” (Igun) discusses the gap created by an international digital divide in Africa. **Chapter 29** focuses on bridging the digital divide that exists between the developed countries and Africa, including African’s universities and libraries, government, and the African economy. Recommendations that lead to bridging this gap are highlighted.

**Chapter 30.** “Technological Strategic Planning and Globalization in Higher Education” (Mittenoff, Keengwe, and Schnellert), presents the results of a study to analyze the perceptions of students and faculty members regarding educational use of communication technologies in two different countries with very different cultures. Communications technologies examined in this chapter include various
online interaction tools with strategic planning using a SWOT analysis approach. The reader will find that statistical data shows differences between certain American universities and the targeted Bulgarian universities. Future research suggests that collecting globally external data for SWOT analysis might benefit strategic planning and technological change in higher education.

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REFERENCES


