Although cooperate America has witnessed increased productivity and effectiveness from investments in information technology, higher education is still trying to cope with applying it to its core processes: teaching and learning. ... There is little doubt that technology has the potential to enhance teaching and learning, but there is a lack of agreement on how it should be used for improving academic productivity and enhancing higher learning. (Ma & Runyon, 2004)

Diverse Learners

The United States (U.S.) is a veritable “salad bowl” of humanity and, in fact, diversity is an established characteristic of American higher education. The diversity currently found on college and university campuses takes into account not just differences in race or ethnicity; it also includes the greater representation of women than in generations past as well as increased educational access to nontraditional students and those with handicapping conditions.

In the early 1960s, most college students were men; but the late 1960s and 1970s witnessed the entrance of women into American higher education in unprecedented numbers. In the present day, the majority of U.S. college and university students are female (Durrence, 2005). Open recruitment of older students in the late 1970s and 1980s swelled the ranks of college attendees by including more nontraditional students, returning students and those wishing to pursue a second degree, thus shifting the demographics of the typical university student. A concerted effort to entice ethnic minorities in the 1980s and 1990s further
broadened the diversity and enriched the population of university campuses across the land (Musil, 1996).

Today’s schools, colleges and universities are called on to serve a more ethnically, linguistically and culturally diverse student population than ever before. Racial diversity in American higher education has the powerful consequence of breaking down patterns of racial separation in neighborhoods, employment settings and within social groups of graduates from racially diverse colleges and universities. For many students, the college and graduate school years represent the first extended period of time spent in an environment other than their home communities (U-M Marketing Communications, 2005). A survey released by the Business Higher Education Forum shows that a majority of Americans think that diversity—and many methods taken by institutions to ensure it—is important in business and higher education (Yates, 2000). It should be further noted that the technology age of today is making new demands on the higher education system in a diverse environment, requiring radical changes in what is taught and how people learn.

**Shift in Faculty Roles**

The faculty makes up a dynamic system within higher education, and each faculty member has to continuously strive to enhance teaching, research, scholarship and service by engaging in the activities of professional development, instructional development, personal development and curriculum development. It needs to be recognized that one of the most critical elements of education in teaching is self-development of the teacher; and, the ultimate goal of education is to enhance the students’ development and learning. By sharing their technological integration and experience, individual faculty members can become resources for each other.

In the book *Promotion, Tenure, and Faculty Review Committees*, an essential resource rich in valuable suggestions, Diamond (2002) emphasizes that for improving students’ learning experiences and enhancing faculty teaching effectiveness, “changes” have important implications for faculty roles in the information age. Diamond summarizes the current trend well:

*Dramatic increases in enrollment, increasing diversity of student bodies, more competition among institutions and, from the private sector, growing demands for institutional accountability, diminishing government support, and increasing availability of technology and associated options for the design and delivery of instruction will all affect institutional priorities and faculty roles.* (p. ix)

Faculty and administrators are paying greater attention to evaluating interdisciplinary work and technology-based teaching and research as well as the changing roles of faculty (Diamond, 2002). Computer-based environments provide a variety of ways to reach learners with different backgrounds, ages, learning needs, external demands from family and employers, linguistic capabilities and personal expectations. As technology continues to enhance the teaching-learning process, “there is an expanding recognition of its potential value in establishing and supporting a student-centered environment” (Spodark, 2001, p. 46).
With the advent of the Internet, the effective integration of the ever-changing world of information technology (IT) into higher education has become an increasingly challenging—but increasingly necessary and rewarding—task. Ma and Runyon (2004) suggest the establishment of a new instructional paradigm—a paradigm that transforms higher-learning institutions from schools that rely on the traditional, individual-oriented teaching model to institutions that use a synergistically discipline-oriented teaching mode.

In this kind of teaching mode, providing computers, software and networked classrooms is certainly necessary, but simply providing hardware, software and a high-speed Internet connection does not bring about the desired integration of technology into higher education. Three elements are essential to provide effective teaching and learning: (1) all faculty members must be able to use the same Internet teaching resource site; (2) collaboration among faculty members should be encouraged and supported, even to the extent of class coverage if necessary, thus, program coordination becomes much easier; and (3) the combined resources of all the technologies available should benefit all faculty members’ teaching and enrich all students’ experience, creating unprecedented synergetic value (Ma & Runyon, 2004).

The fundamental shifts in the role of the professor (from expert dispensing knowledge to a resource or a guide) are illustrated by Janicki, Schell, and Weinroth (2002) in Table 1.

### Table 1. Fundamental shifts in the role of the professor

<table>
<thead>
<tr>
<th>Traditional (20th-century learning)</th>
<th>Resource based (21st-century learning)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher as expert model</td>
<td>Teacher as facilitator or guide</td>
</tr>
<tr>
<td>Textbook as primary source</td>
<td>Variaty of sources or media</td>
</tr>
<tr>
<td>Facts as primary</td>
<td>Questions as primary</td>
</tr>
<tr>
<td>Information is packaged</td>
<td>Information is discovered</td>
</tr>
<tr>
<td>Emphasis on product</td>
<td>Emphasis on process</td>
</tr>
<tr>
<td>Assessment is quantitative</td>
<td>Assessment is qualitative/quantitative</td>
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</tbody>
</table>

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## Technology-Based Teaching

In the educational environment of today, particularly in higher education, technology is still underutilized as a pedagogical tool and, in many cases, remains for the most part untapped (McVay, Snyder, & Graetz, 2005). Many faculty members use IT only for sending and receiving e-mail, browsing a World Wide Web site, providing basic course information and processing text with software like Microsoft Word; beyond those, however, the steep learning curve is a strong deterrent for faculty members to adopt instructional technology (Strauss, 2005). Why have more faculty members, who clearly have the ability to master IT, not taken more advantage of it? Strauss identifies five answers to this intriguing question:

- Faculty do not know what is possible (do not have a clear vision of what IT can do).
• Faculty cannot always tell what is easy to do with IT and what is hard.
• Faculty believe that technology will hurt them.
• Faculty are not interested in IT that is not relevant to their short-term needs (e-mail, Web browsers and the basic of course-management systems are commonly used).
• IT changes too rapidly, and change is disruptive (and faculty may be willing to learn how to use some new software).

Furthermore, maintaining that basic computing support is a utility like water and electricity, Strauss (2005) states that a reasonable goal for an IT staff is to help move faculty members in the right direction with small, even tiny, steps and to provide them with training and software that they can readily use. The ultimate goal is greater instructional quality and capability on the part of the teachers and greater opportunities for learning and achieving on the part of the student.

With greater attention given to the near overwhelming number of technologies available, it still remains of utmost importance for higher education to focus on meeting the academic needs of teacher and student: effective and advanced teaching. McVey et al. (2005) suggest five practices that may enhance instruction and have a positive impact on student outcomes:

• Encourage student-faculty contact.
• Encourage cooperation among students.
• Encourage active learning and give prompt feedback.
• Emphasize time on task while communicating high expectations.
• Respect diverse talents and ways of learning.

Advances in IT have presented universities with new opportunities and challenges, and new vehicles to increase academic productivity and enhance teaching effectiveness in higher learning. Demographic trends in colleges and universities indicate that the student population is becoming more ethnically, culturally and racially diverse. Curriculum designers and instructors are extremely challenged to provide meaningful, relevant and motivating educational opportunities to all learners. The integration of technology into teaching is forcing faculty members to make changes as it increases the quality, diversity and availability of information; at the same time, an increasing dependence on technology can change the teacher-student relationship in student-centered learning environments (Moore, 1999).

To sum up, it is the faculty member’s responsibility to create the conditions in which real and meaningful learning is possible; and, the student’s responsibility to take advantage of that (Laurillard, 1998). Certainly, it is a useful notion.
Purpose of the Book

No matter how it is presented, designed and implemented, technology does play an ever-increasing and necessary role in higher education. Nevertheless, every university teacher faces at least four common areas of academic concern: preparing and organizing courses; teaching and providing assignments; assessing student learning; and evaluating the effectiveness of teaching (Ramsden, 1999). In the present day, in all areas of the curriculum, “teachers must teach an information-based inquiry process to meet the demands of the technology age. Meeting this challenge will be impossible unless educators are willing to join the revolution and embrace the new technology tools available” (Bill Gates, cited in Shelly, Cashman, Gunter, & Gunter, 2004, p. 6.10). Higher education in general and faculty members in particular must be the leaders in the integration of technology in diverse learning environments.

Keeping the above-mentioned four areas of concern facing faculty members in mind, this publication, Technology and Diversity in Higher Education: New Challenges, focuses on educational research and teaching practices of the digital age with the following objectives:

• Discuss theoretical and practical complicity of technology integration for diverse learners in higher education.
• Disseminate current research and analysis in technology and diversity in higher education.
• Examine a technology-mediated teaching in increasingly diverse learning environments.
• Present case studies of online and technology-based education for diverse students.
• Provide future trends and new challenges in implementation of technology and diversity in higher education.

Organization of the Book

Educators have increasingly recognized the importance of accommodating learning diversity in technology-enhanced learning environments. Each chapter of this book touches on an important theme—effective and advanced practices in the information age—through teaching, research, application and integration. This book, consisting of 13 chapters, is divided into six sections: (1) literary reading and technology; (2) case studies in technology and diversity; (3) evaluating the role and impact of technology in medical education; (4) questionnaire research in technology and diversity; (5) development and implementation of technology and diversity in learning; and (6) opportunities and new challenges in technology and diversity.

Chapter 1 inquires as to whether the cognitive and cultural changes incurred by reading fewer books are significant relative to the overall gains yielded by technological change in the classroom learning environment. The author presents evidence that suggests the indispensability of literary reading experience alongside technologically enabled or enhanced modes
of learning. While heralding the positive learning outcomes of computer-aided instruction, the author emphasizes that rigorous assessment must also monitor the changes in literacy that accompany it and which qualify the benefits of technical content delivery.

Chapter II documents the successful formation of an intergenerational computer-tutoring project between college preservice teachers and senior adults living in a retirement community. Service-learning methodology used as a framework is described and the results of the first year of implementation are documented. The authors explain the knowledge, skills and dispositions gained by the college students in the process of tutoring and the project benefits enjoyed by the senior adults. The authors also hope that this can be a model for other universities interested in community-based learning projects.

Chapter III details the project and experience of developing post-secondary distance education in a diverse setting where the author has been involved in the design and implementation of the technology-based education. The author demonstrates how challenges for generating engagement with Web-based online courses can be met and overcome, describing the analysis of the developers’ and students’ experiences. The factors to strengthen and reinforce learning are judged in contributing to student achievement in meeting learning objectives.

Chapter IV describes the challenges and successes involved in crossing the digital divide from traditional to Web-based portfolios in a diverse student environment. The authors emphasize that traditional portfolios, typically in the form of three-ring binders, are now being replaced with electronic versions on CD-ROM, DVD and the Internet. Two directions for electronic portfolios are those created with software tools found on computers or Web-based storage systems generally accompanied by data management systems that allow assessment of portfolio data. The use of electronic portfolios offers great promise but also poses significant challenges.

Chapter V provides a case study of the design and delivery of a course called “Learning with Information and Communication Technologies” (ICTs) guided by a mediated learner approach using new approaches to using ICTs and assessment for learning as key course design drivers. The course aims to prepare future teachers who demonstrate strong theoretical and practical understanding of designing and creating effective ICT teaching and learning experiences. The authors also provide an analysis of the implementation of that course through the presentation of the learning stories and reflections of students.

Chapter VI begins with the statement that medicine is one of the most demanding fields a person can enter. How physicians are trained has been heavily influenced by the advent of the technology era. Technology has progressed faster than society has been able to integrate it. The same is true within schools of medicine and residency training programs. The author emphasizes that many technological advances are available to medical educators and the goal of the chapter is to make educators aware of possible educational tools in the medical program.

Chapter VII examines students’ perceptions of technology experiences based on three important inquires: Are today’s students well prepared for the challenges of the information age? Do students possess the skills and motivation required for self-directed, life-long learning? How can educators help students to better prepare and improve information literacy skills? Data are analyzed based on four variables—gender, ethnicity, academic status and age. Qualitative data (student essays on technology use) are also analyzed to support quantitative student data from a survey questionnaire. Implications for practices are discussed, and future trends are identified.
Chapter VIII presents an analysis of Internet overuse on college campuses in general based on a survey of university students regarding their Internet use. The author emphasizes that one side effect of the technological revolution with the potential to cause harm is an inclination by some people, most notably students in higher education, for excessive and compulsive Internet use. Often called Internet addiction, this disorder is particularly prevalent on the campuses of colleges and universities and, for some students, it has the potential to be as destructive as excessive use of alcohol, tobacco or drugs.

Chapter IX evaluates the state of readiness towards adopting online distance courses between business students and faculty based on the following questions: At what stage of the undergraduate program do students recognize the importance of using the Internet for online education use? What factors explain the rate of adoption towards Internet use by students and faculty? Are there significant differences between undergraduate business students and faculty in the readiness of adoption of online education? The study is timely, given the infancy planning stage of online education delivery at the University of Guam.

Chapter X presents the case of virtual learning environments, which provide electronic access to some or all aspects of campus life. The San Diego State University Interwork Institute is partnering with community colleges in the western Pacific to offer degrees using a unique educational model. Through partnership and technology, this model blends virtual technologies with site-based facilitators and services, enabling Pacific islanders to access advanced degrees without having to travel abroad. It also allows regional 2- and 3-year colleges to build capacity to meet critical local educational challenges.

Chapter XI highlights the technological methods used to collect data from staff members who provided on-site professional development to improve teachers’ knowledge and instructional practices in early reading. Data are collected via video cameras that offered immediate feedback to teachers regarding strategies acquired during professional development activities. Also described are the rewards and potential pitfalls of utilizing technology for both formative and summative uses within diverse contexts, with a focus on the incorporation of cultural, language, political, social and environmental realities of the Pacific.

Chapter XII discusses the different uses of video technology for instruction and assessment. The uses of video provide ways for students with different backgrounds and experiences as well as language differences to effectively engage with their performance and develop their skills, knowledge and dispositions. Through engagement in performance recorded via video technology, students become more motivated to prepare effectively. Their skill level rises both from the motivated preparation and through interaction with the product. The author emphasizes that each of the uses for video technology utilizes different strategies and techniques.

Chapter XIII documents the complexity of concepts of diversity and technology within the context of higher education in the Pacific. The authors identify the challenges and opportunities that a Pacific island university faces as it attempts to address the unique multicultural landscape of the region and its technological realities. The authors further explore the possibilities inherent in directly addressing issues of diversity and technology while at the same time accomplishing the courses’ prescribed academic goals. The authors also provide 10 important lessons learned from the capstone course experience from which others can benefit.

It should be noted that many authors of this publication are from the University of Guam. Although it was not the editor’s intention, it is understandable because faculty members
at the University are in a diverse student environment and the issues of technology and diversity are part of their daily teaching. The university is fertile ground for diverse experiences, practices, discoveries and challenges for teaching and learning. The faculty is eager to discuss the issues and concerns and to make a positive impact on teaching, learning and teacher education.

Advances in technology will constantly bring new challenges to higher education, simply because teaching with technology is inevitably a dynamic, ever-changing process. It is sincerely hoped, in today’s digital age, that each author’s experiences and observations will stimulate the readers to rethink the way it thinks about technology and diversity in higher education.

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References
