INTERNATIONAL & DEVELOPMENT EDUCATION

Post-Secondary Education and Technology

A Global Perspective on Opportunities and Obstacles to Development

Edited by
Rebecca Clothey, Stacy Austin-Li
and John C. Weidman

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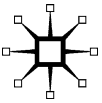

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Abbreviations and Acronyms

AACC	American Association of Community Colleges
AARNet	Australian Academic and Research Network
ADB	Asian Development Bank
AICTE	All India Council for Technical Education
APDIP	Asia-Pacific Development Information Programme
APEC	Asia Pacific Economic Cooperation
BECTA	British Educational Communications and Technology Agency
CEC	Council for Exceptional Children
CHEA	Creating the Council of Higher Education Accreditation
CNE	Comité National d'Évaluation
CSLP	Centre for the Study of Learning and Performance
CTTC	Cyber Teacher Training Centre, South Korea
DBD	Digital Book Disk
DepEd	Department of Education of the Philippines
DE	Distance Education
DFAT	Department of Foreign Affairs and Trade, Commonwealth of Australia
DPA	Degree Program Advisor
eTQM	e-Total Quality Management College, UAE
EDUSAT	Educational Satellite
EU	European Union
EUROCALL	European Association for Computer-Assisted Language Learning
FDI	Foreign Direct Investments
FIPSE	Fund for the Improvement of Postsecondary Education
FYE	First Year Experience
GAA	General Appropriations Act
GAC	German Accreditation Council
GDP	Gross Domestic Product
GER	Gross Enrollment Ratio
HBMeU	Hamdan Bin Mohammed e-University, UAE

HEA	Higher Education Academy
HEI	Higher Education Institutions
ICJS	Institute of Criminal Justice Studies
ICONS	International Communications and Negotiations Simulations
ICT	Information and Communication Technology
ICT4E	Information and Communication Technology for Education
IDP	Internally Displaced People
IGNOU	Indira Gandhi National Open University, India
IHE	Institutions of Higher Education
IIT	Indian Institute of Technology
INMP	International Negotiation Modules Project
ISRO	Indian Space Research Organization
ITD	Information Technology Departments
IWS	Internet World Stats
JANET	Joint Network Team Association
JISC	Joint Information Services Council
LLAS	Languages, Linguistics and Area Studies
LMS	Learning Management System
M2M	Moving to Mathematics
MDNet	Mobile Doctors Network
MNE	Multinational Enterprise
MTS	Multimodus Teaching Strategy
NAFTA	North American Free Trade Agreement
NCERT	National Council for Educational Research and Training, India
NCES	National Center for Education Statistics
NCLB	No Child Left Behind
NEDA	National Economic Development Authority
NGO	Nongovernmental Organization
NICTE	National Institute for Technology for Education
NSDP	No Significant Difference Phenomenon
NWU	North-West University
OAC	Online Asynchronous Collaboration
OCDs	Online Course Developers
OECD	Organisation for Economic Co-Operation and Development
PG	Postgraduate
QIP	Quality Improvement Program, India
RSS	Really Simple Syndication
SABER	System Assessment and Benchmarking for Education Results

SAPA	South African Press Association
SEAMEO	Southeast Asian Ministers of Education Organization
SiMERR	National Centre of Science, Information and Communication Technology and Mathematics Education for Rural and Regional Australia
SMS	Short Message Service
TAFESA	Technical And Further Education South Australia
TRIPS	Trade-Related Aspects of Intellectual Property Rights
UAE	United Arab Emirates
UG	Undergraduate
UGC	University Grant Commission
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNESCO	United Nations Education, Scientific and Cultural Organization
UNFPA	United Nations Population Fund
UNHCR	United Nations High Commissioner for Refugees
UNIFEM	United Nations Development Fund for Women
UoP	University of Portsmouth
USAID	United States Agency for International Development
VLE	Virtual Learning Environment
WEDIS	Women's Economic Development Personal and Social Impact Survey
WGC	Women's Global Connection
WTO	World Trade Organization

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Series Editor's Introduction

Technology is driving changes worldwide at an unprecedented rate in all sectors. Businesses of all sizes rely on technology for communication, management, and innovation. The Internet is the general industry and the social network platform for many businesses in the present and will be increasingly so in the future. Yet there are great disparities in access to the Internet in different geographic regions of the world and among different socioeconomic groups. Although cell phone access has made great inroads in developing country contexts, the majority of people in Indonesia, Peru, South Sudan, and Zambia still do not have access to the Internet. Of the more than 1.037 billion people who reside in Africa, approximately 140 million (13.5 percent of the population) had access to the Internet as of December 2011. This is a tremendous increase in Internet access in Africa over the past decade, yet the region still lags far behind North America and Europe, where 78.6 percent and 61.3 percent of the respective populations were able to access the Internet as of December 2011 (Internet World Stats 2012). In many ways, educational changes, including those that involve technology are rooted in higher education institutions and organizations closely aligned with universities.

Post-secondary education is a subsector that is not accustomed to succeeding in an environment of ongoing and rapid changes. Higher education institutions, especially most traditional universities, are notorious for strong bureaucratic organizational structures that are often antagonistic to technological changes. The very nature of academic freedom—which is so cherished and grounded in the sciences and is fundamental to research—serves as both a deterrent as well as a facilitator to technological changes and innovation. The dominant educational paradigm often restricts or prevents changes including those in technology (Hawkins 2007). Those higher education institutions that are able to adapt and incorporate technology into curriculum delivery, management processes, and marketing programs are often the most successful in meeting changing student needs. If post-secondary education institutions are primarily responsible for training those who enter the formal employment sector in most societies, then instructors at these institutions need to be able to provide graduates with the necessary technological skills to contribute to society. Too often,

however, students have more advanced knowledge of latest technologies than do their instructors. Such is the nature of technology access as it relates to higher education in the twenty-first century.

Open universities and distance education institutions have redefined the meaning of higher education curriculum delivery. Entire universities exist online, which include the registration and enrollment processes, coursework, examination, and granting of degrees. Those who are working fulltime but want to upgrade their skills or earn an advanced degree in their field of work often prefer to pursue a higher education degree by correspondence or entirely online.

It is within this complex technological context that we welcome *Post-secondary Education and Technology* as a volume in our International and Development Education Book Series. It is cosponsored by the Higher Education Special Interest Group of the Comparative and International Education Society and focuses on international perspectives that address challenges, obstacles as well as opportunities for the future of post-secondary education. Editors Rebecca Clothey, Stacy Austin-Li, and John C. Weidman have assembled a respected group of 25 international scholars and practitioners who have contributed 11 chapters to this volume. Even considering all the technological advancements that have been realized in recent decades, as well as the global expansion of higher education, inequalities in education persist in the post-secondary subsector. These inequalities are highlighted in this volume and include issues of gender, socioeconomic disparities, international refugees, and educational policy shortcomings. Several case studies of successes in these areas are also offered to readers. These include how to empower individuals through technology and access to higher education, and in meeting the dynamic changes of individuals and societies.

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Introduction
Education, ICT, and International Development

Rebecca Clothey, Stacy Austin-Li, and John C. Weidman

Higher education has been identified in nations worldwide as an avenue for developing the local human resources and delivering the skilled expertise needed to promote economic development. This recognition has driven individuals, corporations, educational institutions, as well as governmental and nongovernmental organizations to make education a top priority.

As the global commitment to educational access has become integral in all levels of society, new technologies have also been developed that hold tremendous promise for expanding higher education's reach. The simultaneous demand for advanced education and the potential of technology to expand education access beyond national borders has resulted in previously unavailable and far-reaching, innovative ways to deliver educational programming.

The Internet and mobile communications have revolutionized the way people access and distribute information on a global scale. Distance learning, open source courseware, e-books, wikis, and many other innovative technologies have advanced education by providing the capability to connect any topic in any discipline to learners in almost any place, greatly expanding opportunities for access to post-secondary education. This new reality has generated vastly expanded possibilities for international collaboration, knowledge building, sharing of best practices, and new ways to teach–both inside the classroom and out–thereby providing the inspiration and impetus for this volume. However, even as modes of providing education proliferate, the digital divide continues to grow, raising new issues regarding effective ways in which to apply technology solutions to expand educational access and promote economic development.

This book looks at innovations in and challenges to the ways in which technology can be used to expand access to post-secondary education and

contribute to a nation's economic development, through a set of case studies and analyses written by people involved in relevant projects around the world. The book builds upon the content of two virtual symposia jointly hosted in 2008 and 2010 by Drexel University, Wainhouse Research, and the World Bank's Global Development Learning Network in Beijing. The original concept for the symposia emerged from a desire to create a worldwide community of scholars and practitioners who were committed to cross-cultural collaboration and improved educational programming, without requiring the expense of travel across continents. The symposia offered content created by educators for educators, utilizing video technology and open source courseware to provide synchronous panel discussions and live keynote lectures from international experts based in the United States, Austria, the Philippines, China, and Japan (Clothey 2010). People were able to participate live from anywhere by simply clicking a link. In addition, the Web 2.0 tools enabled interactivity, so participants could also ask questions of the experts and communicate with other participants via chat modalities. Additional recorded presentations from five continents were available for viewing comments online, and all live sessions were also recorded for on-demand playback later (Clothey 2010).

The diversity of the symposium participants indicates the potential that information and communication technologies provide for global collaboration. For example, the 2008 inaugural symposium attracted registrants from 13 countries and 5 continents. Additionally, although the symposium was held in English, participants included native speakers of English, Chinese, Spanish, Korean, and Urdu (Clothey and Austin-Li 2009). This exchange was the inspiration for presenting a set of analytical case studies that highlight technology's diverse applications in education worldwide, offering real-life examples of uses of various technologies from authors around the world. At the same time, the conclusions and recommendations in the book are research based and therefore offer practical applications for education practitioners and policy makers. Beyond focusing simply on technology use, the book is framed within the context of expanding access to disadvantaged populations to whom post-secondary education has been denied for reasons including poverty, location, and gender. Although all the cases explored in this book promote the use of technology for expanding access, the book also takes a critical look at the realities of implementing these new tools and approaches, especially in, but not limited to, the developing world.

Higher Education in the Information Age

Philip Altbach, Liz Reisberg, and Laura Rumbley (2009, i) assert that "an academic revolution has taken place in higher education in the past half

century marked by transformations unprecedented in scope and diversity." An increase in widespread participation in tertiary education, or the massification of higher education over the last several decades, has driven many of the key transformations (Altbach et al. 2009). The United States was the first country to achieve mass higher education, with 40 percent of the traditional 18–22-year old age cohort attending post-secondary education in 1960, but most countries have increased participation rates since then. The proportion of this age cohort enrolled in higher education has grown globally from 19 percent in 2000 to 26 percent in 2007, with a total of 150.6 million tertiary students of all ages enrolled worldwide (Altbach et al. 2009).

As a result of massification, new challenges have emerged for post-secondary institutions. Much of higher education's expansion is due to new avenues of access to higher education, which were previously closed to all but the elite. Never has the tertiary student body been so diverse in terms of age, race, ethnicity, and gender. For example, in 2009, 42 percent of US college–aged students were at least 25 years of age and 57 percent were female. In addition, the proportion of White college students in the United States has declined between 1990 and 2009 from 78 to 62 percent, while racial and ethnic minorities have increased—Blacks from 9 to 14 percent; Hispanics from 6 to 12 percent; and Asian/Pacific Islanders from 4 to 6 percent (Snyder 2011, 13). Such diversity requires new teaching strategies and learning supports, including new approaches for reaching student populations with various mother tongues.

In addition to the demands of serving more diverse student populations, the sheer increase in numbers also strains available resources in tertiary institutions. Institutions must ask faculty to teach larger classes, or hire more faculty. In fact, in many countries the average qualification for academics has declined because the supply cannot meet the demand. Altbach et al. (2009) estimate that as many as half of all university teachers in the world have earned only a Bachelor's degree. In China, which is now the world's biggest provider of higher education, only 9 percent of the university faculty have doctorates (Altbach et al. 2009).

The need for infrastructure to accommodate a growing student population is also a challenge for post-secondary institutions, particularly in a climate of decreased finances. Sub-Saharan Africa is a world leader in tertiary enrollment growth, having seen a 20-fold increase in the past 40 years. However, tertiary education systems there are not equipped to absorb the growing demand (UIS 2010). In India, half of the 1.2 billion population is younger than age 25, and the Indian government says the country must build 1,000 universities and 50,000 colleges within the next decade to accommodate them (Arnoldy 2012). At the same time, the worldwide shift to a knowledge economy also has led to the need for new skills in the labor

market, requiring professional development, new credentials, and retraining. Not surprisingly, post-secondary institutions are increasingly being asked to address these societal needs as well.

Nevertheless, despite broader post-secondary participation globally, not all sectors of society have benefitted equally. Students from rural and impoverished backgrounds continue to be underrepresented at the tertiary level in most nations, and while strides have been made, there continue to be disparities across ethnic and gender lines in many places as well.

ICT as a Mechanism for Meeting the Challenges Tertiary Institutions Face

The potential connection between ICT (Information and Communication Technology), education, and national economic development goals has been enthusiastically promoted by international agencies and national governments alike. Crafting enabling legislation for more technology-based education is now one of the predominant global challenges across industrialized nations (Selwyn et al. 2001). International agencies such as the United Nations Development Programme (UNDP) promote ICT as an enabler to address socioeconomic variations in educational access, and the United Nations Educational, Scientific and Cultural Organization (UNESCO) advocates ICT for facilitating the modernization of education, improving the quality of learning, and enhancing the quality of life in general.

Among the more remarkable stories for promoting ICT for economic development is that of Rwanda, a nation with a per capita income of about US$560 per year (US Department of State 2011). The Rwandan government's 2000 report, *Rwanda Vision 2020,* proposed to make Rwanda into a technology and communications hub and to use the Internet to transform the country from an agricultural to a knowledge-based society by the year 2020. Since then, Rwanda has constructed approximately 2,300 km of optical fiber cable network across the country. The cost of the fiber optic cable network for this low-income nation was approximately US$95 million (Fiber Optic Mania 2011), an investment that demonstrates a firm belief in the ability of the Internet to promote national development.

Internet technology, in particular, has been advocated for its potential to broaden the reach of education beyond the brick-and-mortar confines of schools. In fact, the governments of many countries have supported distance education as a means of promoting greater educational access (Clothey 2008), and distance learning is becoming more commonplace

across many educational sectors. The growth in online distance learning as a viable means of educational delivery has coincided with the expansion of technology use across the world. The Internet World Stats (IWS 2011) reports that there was a 440.4 percent growth in Internet usage throughout the world during the decade of 2000–2011, with a 78 percent Internet penetration rate across North America in 2010. Currently Asia accounts for 44 percent of the total world Internet usage (IWS 2011), and Asia also has the largest number of adult online learners in the world (Latchem and Jung 2010). Furthermore, more than 100 universities worldwide have placed *free* content online, and five thousand free online classes are now available through institutions in the United States, Japan, Vietnam, and India, among others (Bonk 2009). These trends, as well as pedagogical and technological innovations, have increased the potential for interaction and collaborative work in distance learning at the tertiary level.

Nevertheless, the best technology is useless if infrastructure and the proper training to use it remains inadequate. Both ICT and Internet availability are inconsistent from one region to another. The 2010–2011 Global Information Technology Report, which assesses "the conduciveness of national environments for ICT development and diffusion," did not rank a single Latin American country in the top 20, and most countries of sub-Saharan Africa ranked at the bottom of the scale (Dutta and Mia 2011, x).

Furthermore, while a UNESCO (2011) report shows that the penetration of computers in high-income countries is quite high (an average of 67 computers per 100 people), the penetration is still low in many parts of the world. In Eastern European, Central Asian, and Latin American countries there are 11 computers per 100 people; in East Asian, Pacific, Middle Eastern, and North African countries there are 6 per 100. In South Asian and sub-Saharan African countries, penetration is particularly low, with only 3 and 2 per 100, respectively (UIS 2011). Differences are even greater for Internet access.

Almost 80 percent of the world's Internet users are located in Europe, Asia, or North America (IWS 2011). Furthermore, although developing countries have 80 percent of the world's population, they have just 5 percent of the world's Internet hosts. In contrast, North America has only 5 percent of the population, and 65 percent of the world's Internet hosts (Bjarnason 2007).

In many places, this divide is also prevalent within countries where rural areas commonly have poorer ICT infrastructure than urban areas. China, for example, has a 30 percent Internet penetration, with over 500 million users (Kan 2012). However, rural users account for a mere 1.2 percent of that total (McQuaide 2009). Similarly, although information technology has been recognized as a means for sustaining development in

India, the International Energy Agency reported in 2010 that more people in India lack access to *electricity* than any other nation. There is also a digital divide between states in India. In 1994, electricity was available to 83 percent of households in the Punjab, but only 15 percent of households in West Bengal, and 404 million people nationwide remained without electricity in 2010 (Remme et al. 2011). In addition, while India claims only 0.37 percent of the overall population as Internet users, more than two-thirds of these users reside in either the capital city of New Delhi, or in one of India's state capitals. One-third of all Internet users are from one of only two cities, either New Delhi or Mumbai (Chandrasekhar et al. 2004).

ICT, Language, and Cultural Barriers

As Jayson Richardson (2009) reminds us, the digital divide is not solely about whether individuals have access to the Internet. It also involves the ability of the end users to access and apply information to create new knowledge (Richardson 2009). There are therefore many issues of access that even better technology infrastructure and training resources cannot address. Some of the most challenging are those related to language and culture. For example, the top two most used languages on the Internet are English and Chinese, together comprising more than half of the total number of websites, and 82 percent of all websites are in one of only ten of the world's languages (IWS 2011). However, there are 6,000 languages across the world, and most of these do not appear on the Internet at all.

A 2005 UNESCO study found that 80 percent of all web pages hosted on African domains were written in English. African languages accounted for only about 1.3 percent of the more than one million web pages examined in the study. The study also found that some of Africa's major languages were absent from the Internet altogether (Fantognon et al. 2005). In Southeast Asia, the diverse population utilizes some 15–20 different written scripts; in China there are an estimated 80–100 languages, many of which use different scripts or do not have written scripts at all (Clothey 2005). In any case, many of the major software packages are currently incapable of producing letters or characters for some local languages, meaning that providing a culturally relevant curriculum online for a linguistic minority student population may present an extremely difficult challenge to overcome.

Sedef Uzuner (2009) describes numerous studies that show students' cultural beliefs and practices affect the way they interact, even in online settings. He finds that cultural differences in fact hinder students' success

in asynchronous online learning environments and cause them to experience "feelings of isolation, alienation, and dissonance out of conflict with the dominant educational culture" (5). Despite the existence of these studies, culture remains an underexplored facet of instructional design and technology use (Young 2008).

A key challenge faced by both established and new technology-enhanced educational programming worthy of consideration is related to the difficulty associated with assessment and evaluation. Altbach et al. (2009, xv) claim that there is a "pervasive disconnect between employing new ICTs and enhancing quality." Furthermore, UNESCO (2011, 15) reports that there is an "inconsistent relationship between the availability or use of ICT and student learning." Roger Harris (2004, 4) also states that "[m]uch of the evidence in support of the use of ICTs for alleviating poverty remains anecdotal, and initiatives are proceeding with little reference to each other." Even so, UNESCO strongly advocates the implementation of policies that support the development of ICT infrastructure and use worldwide (UNESCO 2011). This suggests that continuing assessment of the various educational programs that employ ICT is necessary, and that these results must be widely shared among scholars and practitioners–a motivating force for this book. As Harris (2004, 4) notes of ICT use, "As experience accumulates, we can begin to make general sense of it by detecting recurring themes and patterns of relationships that can be usefully carried forward."

Overview of the Book

This book tackles many of the issues outlined in the foregoing and covers not only a wide spectrum of educational programming and technology application but also cases from a variety of regions and countries. Since our original goal was to share experiences and best practices from both developed and developing nations, it was heartening to receive chapters from Africa, Asia, Europe, the Middle East, and the United States. The one region not represented is Latin America, perhaps due to our focus on circulating the call for papers via digital avenues. Chapters were selected both as representative of the experience of specific regions and for their relevance to the global community.

The first several chapters of the book focus on existing policy issues at the micro and at the macro level. The first chapter, by Mercedes del Rosario, analyzes specific policies that have been implemented in various countries of Asia to promote the use of ICT in education. She uses the

frameworks of modernization and human capital theory to argue that such policies, though heavily pushed by international agencies and developing countries to promote economic development and modernization, often do not align with the actual contexts and needs of the countries in which they are implemented. As she points out, the existence of Internet connections or computers has little to do with their successful use; national technology policies, therefore, need to be reconsidered to meet practical goals if they are to contribute to a nation's economic development.

Robyn Smyth, Trish Andrews, Richard Caladine, and Jason Bordujenko (Chapter 2) discuss a survey of Australian universities where rich media technology is widely used. Their findings reveal that such technologies have great potential for reducing costs and environmental footprints across the higher education sector and also for improving the efficiency of administration and innovations in research and pedagogy. However, their research also indicates that a lack of coherent policy and planning for such technologies within the higher education sector is limiting their potential for maximum use. These authors argue that rich media technologies have not maintained their status as "lighthouse technologies," because their capability in a digital world is not well understood by managers and others beyond a small number of videoconferencing enthusiasts. Hence, to maximize the benefits of any ICT use, there must first be streamlined and transparent policies for its utilization.

In Chapter 3, Minghua Li addresses how to increase access to post-secondary education for nontraditional, working, and remote students by creating a virtual community of educators and educational programs built upon a common infrastructure of local learning centers networked into an educational grid. This open community college approach enables a broader array of services to reach these populations while limiting capital investment. Li addresses some of the challenges that this model faces, including the need for physical learning centers, monopoly providers, investment incentives, and assessment and accreditation of such educational programming.

The next chapters are case studies that look at ICT use for capacity building. Charl Wolhuter, Hennie J. Steyn, Elsa Mentz, and Ferdinand J. Potgieter (Chapter 4) discuss the increasing enrollments at South African universities, and the resulting strain of teaching larger class sizes on faculty. In this case, the authors have attempted to develop a strategy to deal with the large classes without sacrificing retention or student achievement. To do so, they launched a blended learning approach to teaching in which larger classes were supplemented with digital course materials in one of several South African languages. Students could select the language with which they were the most comfortable. In addition to relieving some of the

burden on faculty who taught large classes, the student evaluations of the blended classes were more positive than those for the traditional face-to-face classes in the same subject! Furthermore, they found that providing the course materials in multiple languages also addressed the challenge of linguistic diversity that cannot typically be resolved in a traditional face-to-face setting.

Tricia Coverdale-Jones describes in Chapter 5 the implementation of distance learning within a single faculty at a university in the UK. She identifies sources of resistance among academic staff and describes the support system that was established to assist them with learning how to use ICT resources effectively. She argues for the importance of providing sufficient human resource support to augment technological infrastructure and facilitate use of eLearning techniques by sometimes resistant academic staff.

In India, where the need to expand university infrastructure for the masses is critical, the quality of the university level teaching faculty is low in large part, because many lecturers hold only Bachelor's degrees. In Chapter 6, Kalpana Kannan and Krishnan Narayanan focus on this concern, describing a nationwide online, live, synchronous teacher training workshop for teachers of engineering at the tertiary level. The distance modality of the workshop, which was designed to increase the professional credentials of university-level faculty, enabled facilitators to reach a large number of people across the country and at a lower cost than comparable face-to-face training. In addition, they were able to reach individuals located in rural and remote locations. However, the authors also discuss the challenges their program faced, including power outages during the workshop, as well as a lack of ease of some users with the technology, which hindered the program's success.

Ellen Clay and Michel Miller (Chapter 7) also describe using distance learning to improve credentials of teachers in remote areas of Pennsylvania, US. Although Pennsylvania state regulations require certification for teachers of mathematics, many special education teachers who must teach mathematics do not meet state requirements for the subject. Teachers living in rural areas often do not have easy access to the necessary professional development programs to gain the credentials they need. To address this issue, Clay and Miller developed a state-funded, online, asynchronous professional development program to train in-service special education teachers to teach mathematics. Similar to the strategy employed in South Africa, Clay and Miller's approach was aimed at scaling up instructional support to reach a maximum number of teachers requiring in-service education, without sacrificing educational quality or teaching efficiency.

The next set of chapters focuses on formal and nonformal uses of ICT to enhance educational opportunities for other underserved populations.

In Chapter 8, Rosalind Latiner Raby, Joyce P. Kaufman, and Greg Rabb describe the International Negotiation Modules Project (INMP), an online simulation for enhancing the learning and teaching of international issues across the US community college curriculum in places where many US students have had limited opportunities or exposure to international experiences. Raby and her colleagues discuss the challenges of internationalization at community colleges and promote INMP as a viable model for an innovative approach to internationalization of the curriculum, teaching, learning, and faculty development.

Dorothy Ettling and Maria Marquise (Chapter 9) also facilitate internationalization and cross-cultural exchange in their description of a six-year, web-based dialogue among rural women in the Bukoba region of Tanzania, Mongu, Zambia, and San Antonio, TX, US. The dialogue was initiated as a means of cross-cultural exchange and expanding leadership capacities. It grew over the years into a significant opportunity, not only for the sharing of ideas but also as evidence of personal and social empowerment in the women's lives, utilizing web-based technology was a major source of new education and insider knowledge for the participants. Ettling and Marquise's chapter documents the evolving learning process of the women, utilizing frameworks of women's empowerment, and technology innovation.

Rana Tamim's Chapter 10 also looks at the use of technology to enhance women's empowerment. Her case study focuses on a group of young women in the United Arab Emirates (UAE) who are able to go beyond the roles dictated for women by local religious, social, and cultural norms and pursue higher education through a blended face-to-face and online delivery format offered at a new e-Learning university. The educational opportunity she describes empowers mature female learners and allows them to achieve their personal goals and academic development while meeting their professional commitments and family obligations. Finally, Safary Wa-Mbaleka (Chapter 11) discusses the potential ICT may hold for addressing the unique needs and challenges of refugees and internally displaced people in Sub-Saharan Africa.

Reflection

ICT is not a magic bullet that easily transcends existing inequalities related to poverty, class, ethnicity, nationality, locale, or other issues. Nevertheless, it does provide some possibilities, and there are developing trends that suggest positive change for the future.

Capitalizing on the technologies that are already commonly in use in local communities is imperative. Most nations do not have the financial means to construct US$95 million worth of fiber optic cable to make Internet access widely available as was done in Rwanda. Even if they did, it would still be necessary to train individuals to use it before educational programming via the new technology could be introduced, and there would be no guarantee the new technology would be accepted within the target community.

In addition, as student populations become more diverse, ICT must be utilized creatively to maintain respect for diverse virtual classroom communities, and to build on unique cultural customs and strengths (Wellburn and Claeys 2004; Latchem 2005). Collaborative efforts between diverse communities in designing and implementing educational programming allows diverse global populations to learn from each other and maximize their respective strengths. More efforts are being made to produce web-based educational materials in multiple languages, and more languages are also becoming available through Internet-based translation software. If these trends continue, ICT can promote some greater opportunities for educational access and for international exchange.

However, continuing to find ways to maximize the potential of ICT to benefit all users will remain a challenge in the twenty-first century. It is our hope that this volume will provide an avenue for scholars and practitioners to gain new perspectives on the opportunities and challenges of implementing such programs that are both practical and thought-provoking. On the whole, as editors, we found the projects and people we encountered through this volume to be both inspiring and critical in the quest to bring higher education of good quality to diverse and underserved populations.

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Part I

Policy Debates