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Preface

The right to education means that educational opportunity must be both equal and universal. Throughout its existence, UNESCO has sought to expand the reach of educational services and improve their quality. Its commitment to innovation, notably through the use of technologies, is equally long-standing. Since the 1960s, UNESCO has supported a variety of specific projects and conducted studies on a range of topics, including use of technologies for primary education in developing countries, expansion of higher education at a distance, and use of technologies in classroom instruction at all levels.

Educational progress in many developing countries faces a severe double bind. While all now accept the notion of the right to education and the expansion of demand at all levels this right implies, widespread economic stagnation or decline prevents action. These opposing trends put intolerable pressures on many countries’ educational systems. Traditional expansion of education systems in many parts of the world will be impossible, so new resources and methods must be found. Impressive advances in technology over the past few years provide new hope that technological solutions, intelligently applied, can allow greater access, higher quality, and lower cost per learner. To achieve massive improvements through technologies will require learning from past mistakes and careful analysis of how to innovate broadly and durably.

UNESCO’s current program has a strong emphasis on the use of technologies in and for education. This monograph is intended to help educational decision makers survey the technological landscape and its relevance to educational reform. This monograph is firmly rooted in a vision of education that begins with the learner and attempts to understand how technological tools can better contribute to educational goals. It looks at how technology can promote improvements in reach and delivery, content, learning outcomes, management of systems, teaching, and pertinence. In short, it is a contribution to global reflection on how to make learning throughout life a reality.

John Daniel
Assistant Director-General for Education
United Nations Educational, Scientific and Cultural Organization (UNESCO)
Foreword

For 40 years, the Academy for Educational Development (AED) has devoted itself to fostering worldwide development in education, health, environment, family planning, and the economy, often introducing technology as a means to achieve development goals.

Today the demand for educational technology is high, and when technology is used thoughtfully and is learner centered, the results are gratifying. Again and again, we have witnessed the power of technology to enable people to learn and to interact, even in the most remote areas of the developing world. Through increased outreach we are helping to build the IT capacity of underserved populations such as people in rural areas, women, those with disabilities, and speakers of minority languages.

Lower costs and more flexible, adaptable, and user-friendly hardware are making this possible. So, too, is a new generation of teachers, planners, and administrators who understand the value and utility of the technologies. In its first international ed-tech project—evaluation of El Salvador’s educational TV program—AED witnessed the impact that such thinkers can have on an educational system. In El Salvador a forward-looking minister of education viewed cutting-edge technology not only as an opportunity to deliver innovative programs to school children—the original purpose of the project being evaluated—but also as a means to achieve broader reform of a complex educational system. More than 25 years ago, he demonstrated technology’s potential for educational change.

Long ago we learned that technology is not the answer unless it reflects learners’ needs and suits their environment. Technologists then become their partners, and the new technologies help learners learn, conduct business, advocate for causes, receive information, and participate in the marketplace. AED is one such partner that provides assistance in planning, training, assessment, and hands-on support to ministries, communities, schools, and international donor agencies to help spread the effective use and application of the technologies.

It is imperative for decision makers and practitioners to share their experiences with educational technologies. Thus this book is an attempt to organize what is known in terms of research, thinking, and experience. It captures much of the progress in the field. It also identifies the challenges we still face.

AED, an independent, private, nonprofit organization, is delighted to co-publish this important book with UNESCO. Together we hope to further the dialogue about the promise of the new technologies for learning and development.

Stephen F. Moseley
President and CEO
Academy for Educational Development
Acronyms

ACOT  Apple Classrooms of Tomorrow
AVU  African Virtual University
BBC  British Broadcasting Company
CAGR  compound annual growth rate
CAI  computer-aided instruction
CAL  computer-assisted learning
CATT  Computer-Assisted Teacher Training project
CAUA  China Association of Universities for the Aged
CBT  computer-based training
CFI  Centre de Formation des Instituteurs
CIED  Centro Internacional de Educacion y Desarrollo (Venezuela)
CLN  Cisco Learning Network
CMC  computer-mediated communications
CODECS  Center for Open Distance Education for Civil Society (Romania)
COHCIT  Consejo Hondureño de Ciencia y Tecnología (Honduras)
COL  Commonwealth of Learning
COLME  Commonwealth of Learning Media Empowerment
CONNECT-ED  Connectivity for Educator Development, Uganda
COW  computer-on-wheels
CRM  customer management relationship
CSCW  computer-supported collaborative work
DANIDA  Danish International Development Assistance
DC  direct current
DECT  digital European cordless telephone
DHTML  Dynamic Hypertext Markup Language
DOS  disc operating system
DSL  digital subscriber line
DVD  digital video disc
EBS  Educational Broadcast Services
EDC  Education Development Center
EdTech R&D  educational technology research and development
EOE  Educational Object Economy
ePOW  electronic Problem of the Week
ERIC  Educational Resource Information center
ERP  enterprise resource planning
ESCOT  Educational Software Objects of Tomorrow
FQEL  Fundamental Quality and Equity Levels project
FRM  Roberto Marinha Foundation
GDP  gross domestic product
GNP  gross national product
GLOBE  Global Learning and Observations to Benefit the Environment
GLS  Global Learning Solutions
GMI  General Motors Engineering and Management Institute
GPL  General Public License
ICT  information and communication technology
IDB  Inter-American Development Bank
IDG  International Development Goal
IESA  Instituto de Estudios Superiores para la Administracion
ILCE  Instituto Latinoamericano de la Comunicación Educativa
ILO  International Labor Organization
IMS  Instructional Management System
IP  Internet Protocol
IRI  Interactive Radio Instruction
ISDN  integrated services digital network
ISP  Internet service provider
ISTE  International Source for Technology in Education
IT  information technology
ITEK  Institute of Education Kyambogo (Uganda)
ITESM  Technological Institute of Monterrey (Mexico)
ITS  intelligent tutoring system
IVEN  International Virtual Education Network
JBTE  Joint Board of Teacher Education
KRDL  Kent Ridge Development Laboratory
LAN  local area network
LGPL  Lesser General Public License
LTNet  Learning Technologies Network (United States-Brazil)
LTSC  Learning Technology Standards Committee
LVI  LucentVision Interactive
MBEC  Ministry of Basic Education and Culture (Namibia)
MECC  Minnesota Educational Computing Corporation
MERLOT  Multimedia Educational Resource for Learning and Online Teaching
MONE  Ministry of National Education (Turkey)
NASA  National Aeronautics and Space Administration
NGO  nongovernmental organization
NIED  National Institute for Development (Namibia)
NOAA  National Oceanic and Atmospheric Administration
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<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
<th>Description</th>
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<tbody>
<tr>
<td>NOS</td>
<td>National Open School (India)</td>
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<td>NSF</td>
<td>National Science Foundation</td>
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<td>NSU</td>
<td>Nova Southeastern University</td>
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<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
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<td>OLA</td>
<td>Open Learning Agency (B.C., Canada)</td>
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<td>OLI</td>
<td>Open Learning Institute of Hong Kong</td>
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<td>OSS</td>
<td>open system software</td>
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<td>OUHK</td>
<td>Open University of Hong Kong</td>
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<td>PC</td>
<td>personal computer</td>
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<td>PC3</td>
<td>Public Computer and Communication Center program</td>
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<td>power line networking</td>
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<td>POP</td>
<td>point of pressure</td>
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<td>PSA</td>
<td>public service announcement</td>
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<td>PTA</td>
<td>parent-teacher association</td>
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<td>PTC</td>
<td>Primary Teacher Training College (Uganda)</td>
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<td>QOLN</td>
<td>Queensland Open Learning Network</td>
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<td>RADECO</td>
<td>Radio-Assisted Community Basic Education</td>
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<td>RAM</td>
<td>random access memory</td>
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<td>RASCOM</td>
<td>Regional African Satellite Communications</td>
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<td>REDUC</td>
<td>Red Latinoamericano de Informacion y Documentacion en Educacion</td>
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<td>RIVED</td>
<td>Red International Virtual de Educacion</td>
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<td>SEP</td>
<td>Secretaría de Educación</td>
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<td>TCP</td>
<td>transmission control protocol</td>
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<td>TCO</td>
<td>total cost of ownership</td>
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<td>TECSUP</td>
<td>Higher Technological Institute (Peru)</td>
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<td>TIMSS</td>
<td>Third International Mathematics and Science Study</td>
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<td>TRIPS</td>
<td>Trade-Related Intellectual Property Rights</td>
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<td>TVRO</td>
<td>television receive only</td>
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<td>UHI</td>
<td>University of the Highlands and Islands (Scotland)</td>
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<td>UNDP</td>
<td>United Nations Development Program</td>
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<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organization</td>
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<td>UP</td>
<td>University of Phoenix</td>
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<tr>
<td>UPS</td>
<td>uninterruptible power supply</td>
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<td>URL</td>
<td>Uniform Resource Locator</td>
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<td>USAID</td>
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<td>Universities of the Third Age (China)</td>
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<td>VEE</td>
<td>Virtual Exchange Environment</td>
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<td>virtual high school</td>
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<td>VITA</td>
<td>Volunteers in Technical Assistance</td>
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<td>VSAT</td>
<td>very small aperture terminal</td>
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<td>WHO</td>
<td>World Health Organization</td>
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<td>WTO</td>
<td>World Trade Organization</td>
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<tr>
<td>XML</td>
<td>Extensible Markup Language</td>
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