Foreword

Technologies of the 21st century have and continue to market new horizons for advancing learning toward global competence. News agencies highlight promises that new technologies guarantee the development of intercultural individual and social competence. All that is needed is for educators to examine the curriculum and instruction and explore new pedagogies for implementing the technologies. As F. L. Devereux (1933) claims:

The modern school is forced to meet the demands of a rapidly changing civilization. Today the world of the learner is almost unbounded. He must acquire facts relating to a bewildering variety of places and things; he must acquire appreciations of far-reaching interrelationships. The curriculum and methods of teaching must undergo a continuous appraisal. New subject matter and new devices for instruction are being scrutinized for their potential contributions to the learning process. (p. 1)

What is interesting about Devereux's recommendation is *when* he wrote it – 1933 - and the technology that he endorsed was the *educational talking picture*. Devereux further extends his challenge to educators for thinking about the potential impact of educational talking pictures on education:

The introduction of the use of the talking picture into education may prove to be an event as epochal as the application of the principle of the wheel to transportation or the application of steam power to the industrial age. No development in education since the coming of the textbook has held such tremendous possibilities for increasing the effectiveness of teaching as the educational talking pictures. (p. 101)

Now, after more than 85 years, the influence of the talking pictures has done little to change education. Today, the advancing digital technologies have changed, offering significantly different capabilities for enhancing education. Educators are increasingly challenged to redesign education in ways that develop global competence by transforming traditional educational models into a vision that incorporates the newer technologies to advance global learning.

Today's technologies have the potential for empowering learners, engaging them in communication, collaboration and shared knowledge development for advancing global learning. A critical challenge for such a shift, however, relies in the teachers' knowledge for integrating these technologies in their instruction – their technological pedagogical content knowledge (Mishra & Koehler, 2006). To further clarify this transformed knowledge, Niess (2005) identified a combination of four knowledge components teachers need to develop:

1. An overarching conception of what it means to teach particular subject matter topics with appropriate technologies;
2. Knowledge of students' understandings, thinking, and learning in the subject with appropriate technologies;
3. Knowledge of instructional strategies and representations for teaching particular topics with appropriate technologies;
4. Knowledge of curriculum and curriculum materials with learning in the content areas with appropriate technologies.

The shift to global education through the implementation of the 21st century technologies in education necessarily impacts the teachers' pedagogical reasoning. This new form of reasoning shifts from *linear thinking* about a single technology for a single purpose to *systems thinking* that engages learners with multiple technologies that support multiple tasks of communication, collaboration and shared knowledge development. Such a change supports the emergence of educational technology mash-ups, applications that integrate multiple different technologies for student learning, hopefully toward a global education. Rather than traditional textbooks, students use *flexbooks*, authoring platforms that provide customized content that supports different learning styles, regions, and skill levels. Through the interconnections of multiple computing devices embedded in everyday objects in these *flexbooks*, students are able to send and receive data as they work individually or in small groups. In their classrooms, students engage in peer-to-peer learning activities that involve project-based learning and collaboration where the technologies support collaboration and connection with peers in perhaps a single class, school or even country. Their teachers spend time facilitating higher order learning skills (such as critical thinking, creativity, and complex problem-solving inquiry), challenging students to extend their learning through individual or small group experiences. In essence, teachers or mentors can manage the instruction rather than dictating and delivering.

This vision of 21st century learning suggests a future for global education as a dynamic system, constantly changing based on multiple and diverse inputs. Such a vision of global learning will not just happen with the development of new technologies and the beliefs and recommendations of educational leaders such as that for educational talking pictures. As this book demonstrates, trends are evolving and the book's value is through the global perspectives provided by educational authors and researchers from throughout the world. The first section considers how technology is transforming global education by sharing challenges in the design of video games to enhance cultural intelligence. The ideas of virtual teamwork are explored along with the intercultural and virtual competences that emanate from work that considers education in countries such as Spain and Germany. The second section shifts thinking to the educational reformation in China where teacher education addresses the teachers' knowledge development for transforming their knowledge for incorporating new pedagogies for teaching in the 21st century. For example, the pedagogy of group mentoring through student-to-student, teacher-to-student, or teacher-to-teacher organizations examines progress toward global competence. The third section highlights challenges and opportunities for advancing learning toward global competence from diverse educational researchers. Here, the influence of technologies in the design of personalized learning environments as well as the value of experiential learning to support brain development are examined through the influence in the development of global competencies.

Does this book present all the current research being conducted on global approaches to education? Of course, this book does not meet that challenge, but it does present some trends and directions. Perhaps

the key importance of this book is through the generation of enthusiasm for reforming education toward more global approaches. Many questions are also highlighted through the publication of this book. How must the curriculum be reformed toward a global approach? What evidence-based pedagogies will lead to the student learning that develops global competence? The global approach to education is different from how the current teachers and the teacher candidates have experienced. What preparation is needed so that they develop the knowledge for developing the pedagogical reasoning required do frame the learning environment that incorporates multiple technologies as students work in peer-to-peer learning environments? What research is needed to assure the development of global competencies?

Without continued attention to these and many other questions, a global approach to education may become an unrealized vision much as the vision for the impact of educational talking pictures. However, the direction toward global competencies is an important vision for continued research and development, where students are able to take advantage of the 21st century technologies for communication, collaboration and shared knowledge development through global classrooms. May this book energize and strengthen the research and development toward the global approach to education that takes advantage of the 21st century innovations.

Margaret L. Niess
Oregon State University, USA

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