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# Introduction

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THIS BOOK IS DEDICATED TO EDUCATION. We need more education, deeper education, more effective education, more access to education, and more affordable education. While education works well for millions of learners, it doesn't work for everyone. There are millions more whose lives could be transformed by education. For education to do better we cannot just keep doing the same things. This book is also dedicated to finding the game changers that will help us move education to the next level, whether those game changers are information technology, new models, or institutional vision.

Education is complex. Each learner's needs, preparation, personal circumstances, and aspirations are different. Learning is an interaction involving the learner and content, instructors, other learners, systems, and the environment. Learners must play an active, informed role in their education. And their experience is made up of thousands of interactions associated with courses, student services, administrative functions, technology, and people.

Learners encounter roadblocks. Some aren't prepared for college-level work. Many don't have strong study or personal skills. Others have financial challenges. Competing demands from family and work can distract. Some aren't well suited for the major they chose, and many don't know what courses to choose to graduate on time.

Educational institutions have their own roadblocks. Escalating costs. Decreased funding. Rising demand. Increased oversight and regulation. Entrenched practices. Dated models. Constraining policies.

If education is a game changer, what are the game changers for education? This book presents some of those game changers.

How one conceptualizes the educational experience can be a game changer. Institutions such as Western Governors University, Empire State University,

University of Maryland University College, Athabasca University, and University of the People began with unique ideas about how education might be structured, delivered, and assessed.

Information technology is a game changer. It can deliver content instantly, bring distant individuals together, and make administrative processes faster. But IT can be more than a delivery channel. IT can change the educational experience through simulations, games, haptic devices that allow users to “feel,” augmented reality, and more.

But to really change the game, IT must be used differently. Because of IT we can collect data on individual interactions and use that information to predict who is at risk of failing, tailoring interventions to their needs. That same data can be used to create recommendation engines, reminiscent of Amazon or Netflix, that help students select the best courses for their skill level and needs or plan a more efficient pathway to their degree. IT allows people from around the world to collaborate, learning from each other and creating more than any one person could individually.

The book begins with some fundamental questions we must ask about education. Beyond describing the challenges of funding, demographics, and the demand for education, educators must ask what we need to do and how we know if we’ve been successful. Lingenfelter describes many of the challenges of the current environment, including cost, productivity, quality, and how to more seamlessly integrate K–12 and higher education. Humphreys challenges us to first set the priorities for higher education before then looking to technology and other solutions for a means to reach those goals.

A number of game changers are described, including information technology, openness, analytics, assessment, and public-private partnerships. The most important drivers of innovation are the models that harness the power of IT to deliver educational value. Beyond delivering information, IT can power recommendation engines, co-creation, and analytics and enable the unbundling and rebundling of traditional processes. As Wiley and Green illustrate, openness is a philosophy, as well as a model for innovation and business. Through sharing, remixing, and repurposing, value can be created and captured, whether the focus is content or new ideas. Analytics (trend analysis, forecasting, prediction, optimization) allows educators to identify at-risk students and intervene, improving the chances for student success. Analytics is used for course improvement, as well. Baer and Campbell also suggest future directions for analytics. Adult learners bring their own special circumstances, such as the need for recognition of prior learning. Tate and Klein-Collins describe a variety of systems (e.g., prior-learning assessments) that, although designed for adult learners, are broadly applicable. Describing an approach that may allow more institutions

to expand into online and specialized programs, Pianko and Jarrett highlight the growth of public-private partnerships. Smith explores potential models that combine the use of IT and alternate models for course completion and credentialing, providing the potential for greatly reduced costs.

There are multiple examples of institutions that have taken alternative approaches: Western Governors University, the University of Phoenix, Empire State College, Athabasca University, and University of the People. Each institution employs unique combinations of IT, openness, analytics, and student engagement to achieve its goals. Using analytics to drive student achievement, course improvement, and cognitive science is exemplified by Carnegie Mellon University's Open Learning Initiative. Cavanagh describes the use of blended learning and research to create a postmodality era—instruction is no longer face-to-face or online, it exists wherever you want it, having moved past traditional modes. Public-private partnerships are allowing institutions such as the University of Southern California to leverage their expertise and grow programs that were designed digital.

The chapters alone cannot illustrate all the innovative approaches using information technology that might change the game for education. In the book's final section, over twenty case studies provide a wealth of examples of how institutions are improving education with information technology. The case studies span the globe and address new learning environments, approaches to sharing open content, recommendation systems that help students improve course success and reduce time to degree, how IT is enhancing "traditional" courses, and alternative credentialing systems. The cases also describe how research and analytics can drive and support change. Multiple themes are highlighted by these case studies.

- **Changing the learning experience:** Time, convenience, and integration of information can change the educational experience. Institutions such as Ball State University, University of Maryland Baltimore County, and Georgetown University are consciously using IT to change the learning experience, making it more immersive. CS50 at Harvard and Penn State's CHANCE program use technology to enhance traditional environments, resulting in motivating and highly effective learning experiences.
- **Guiding and personalizing:** IT allows students to get the information they need to make better decisions, such as about course selections, transfer options, and degree programs. Helping students make better choices are the goals of the University of Hawaii's STAR program and the University of Hong Kong's iCounseling system. IT can recognize

patterns and match individuals with the courses and program that best suit them. Austin Peay State University's Degree Compass personal recommendation system represents a new era in personalization, which is particularly important for at-risk students. Valencia College created LifeMap and is now extending the student-support system to other institutions. Central Piedmont Community College's Online Student Profile (OSP) system helps ensure that students are successful and is also being adopted by six other institutions.

- **Learner-centered design:** Many case studies illustrate how the learner is at the center of a program's design, such as the Olin College of Engineering and Penn State's World Campus. Norberg describes a blended model in Norway that was designed to meet the needs of students in rural areas. When Royal Roads University began "rethinking residencies," they created virtual-experience laboratories as an alternative to face-to-face residencies. Recognizing that not all students have the same needs is critical.
- **Research:** Research on students and on what works drives innovation and adoption. Walker and his colleagues describe the research programs that support educational innovation at the University of Minnesota and the University of Central Florida. Dulin, Delquadri, and Melander illustrate the essential role of research with the Achieving the Dream reform network and Yakima Valley Community College's Office of Institutional Effectiveness.
- **Open solutions:** Open educational resources are inherently scalable because they can be reused, remixed, and repurposed. The OpenCourseWare Consortium, the Saylor Foundation's open college courseware, and the Washington State Board for Community and Technical Colleges' Open Course Library are examples. And, Mozilla's Open Badges project, in an effort to leverage open educational resources and find a more flexible model for credentialing, provides an alternative to traditional models.
- **Scaling:** Scaling may hinge on moving beyond a not-invented-here mind-set to one that values sharing, allowing institutions to reach more learners and use resources more efficiently. Indiana University's eTexts program is saving students 40 percent or more on textbook costs by aggregating demand and negotiating reduced costs of electronic resources. The Great Plains Interactive Distance Education Alliance is a virtual faculty consortium that allows institutions to more agilely respond to changing educational needs, offering degrees and certificates.

Colleges and universities are complex adaptive systems where people and technology can work together to create value. The college or university learning experience is more than "the classroom." For institutions to make the best use of technology to address educational needs, they must understand the learner and design the desired experiences, taking into account the many social, technical, and intellectual interactions among students, faculty, and staff; the organization; and the infrastructure.

Institutions must design processes and experiences that will allow students to solve their problems and achieve their goals, as well as create long-term educational value both for students and society. However, multiple models will be required, because student readiness, needs, aspirations, and circumstances vary. If students are unprepared, institutions must ask what services and experiences could better prepare them. If students are fully prepared, institutions can still create new and innovative ways to add even greater value to their educational experience.

Much of the use of information technology to date has focused on content delivery that emphasizes information or course management systems rather than on student support or collaborative, interactive, and immersive learning environments. The educators represented in this book are innovating as individuals, programs, and institutions. They are focused on student needs and are designing alternative models that allow students to achieve more of their potential.

Education is a game changer. We owe it to ourselves, our students, and our society to keep working to change education for the better.

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