Developing Online Courses in NURSING EDUCATION

FOURTH EDITION

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Developing Online Courses in Nursing Education

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*We dedicate this book to our
spouses, children, and grandchildren,
who have supported us to persevere with our
commitment to online education.*

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Preface

A comment in the preface of the last edition was that some things are the same and some things are different. In this edition, the conclusion is that some things are the same, and they are the basics of teaching and learning online. However, some things are not only different, they are very different in relation to technology, students, and structure of online learning environments. Some things that are the same are areas of reconceptualization, pedagogy, interaction, course management, assessment of students, and evaluation of courses. In these areas, a review of the literature revealed the most updated best practices, and they are included in this current edition.

The very different things include technology and new structures for teaching and learning. Emphasis on demographics of online learners, expectations of employers, automation, technology, and a focus on lifelong learning is leading to changes in what and how we teach. Institutions of higher learning can no longer teach all the knowledge and skills needed to meet the demands of the employer. Thus, there is a need for lifelong learning and flexible and creative learning environments.

What is on the horizon? In addition to traditional education, massive online open courses (MOOCs), certificates, badges, and stackable degrees will provide education for the purpose of training and retraining. If completed, the new knowledge and skills can be transformed into continuing education or degree programs.

This edition is still about using the web and all its richness to teach students and professional nurses how to use technology and to maintain competency and embrace lifelong learning as a nursing professional. Definitions, history, and best practices for teaching online are described, and they form a foundational knowledge base for teaching (Chapter 1, Introduction to Teaching and Learning in Online Environments). The impacts of demographics, finance, technology, and career development

on teaching and learning using alternative teaching structures are identified (Chapter 2, The Impact of New Directions on Teaching and Learning). Pedagogy and the study of learning provides the theory to develop effective educational programs (Chapter 3, Reflections on Pedagogy in Online Instruction). Theories and frameworks that guide the development and use of flexible learning environments are introduced (Chapter 4, Flexible Learning Environments). Guiding structures of online learning, such as interaction and feedback, are applicable when developing traditional and alternative learning environments (Chapter 5, Guiding Structures for New Learning Environments).

Other chapters deal with reconceptualizing course content from face-to-face to an online environment (Chapter 6, Reconceptualizing the Online Learning Environment); creating blended-learning environments (Chapter 7, Practical Applications in Academic Online Learning Environments); developing, teaching, and evaluating professional education (Chapter 8, Practical Applications in Professional Online Learning Environments); and establishing the pedagogical foundations of teaching continuing medical education (Chapter 9, Theoretical Applications of Continuing Education). The technology courseware and software necessary to teach in online environments (Chapter 10, Technical Considerations to Support Learning Environments), manage online learning (Chapter 11, Course Management Methods), and assess and evaluate learning in online environments (Chapter 12, Assessment and Evaluation of Online Learning) are pertinent topics for teaching online. The last chapter (Chapter 13, The Changing Role of the Nurse Educator) introduces the characteristics that the nurse educator needs in developing and teaching in flexible and creative environments and explains how nurse educators are supporting the direction of the future trends for nursing.

We hope you enjoy the practicality of this book and have fun in the process!

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Developing Online Courses in Nursing Education

1

Introduction to Teaching and Learning in Online Environments

Carol A. O'Neil

INTRODUCTION

This chapter explores the basic concepts and the current landscape of teaching and learning in online environments.

DEFINITION OF TERMS

Distance education is the delivery of content using technology (Seaman, Allen, & Seaman, 2018). Learning takes place when the learner and the teacher are geographically separated (Layton, 2017). The Sloan Consortium (Allen & Seaman, 2018) defines online learning in terms of the proportion of content delivered online. When 80% or more of the content is online, it is an online course. When 30% to 79% is online, the course is hybrid or blended. When 1% to 29% of the content is online, the course is web facilitated, and when no part of the course is online, it is a traditional class. Web-based learning means using the World Wide Web as the teaching and learning strategy. There is a reduction in time and space barriers to learning, and learning can take place anytime and anywhere.

HISTORICAL PERSPECTIVE OF TEACHING WITH TECHNOLOGY

The practice of teaching and learning at a distance is not new to education. Paper-based distance curricula in which the learner enrolled in a university and received learning packages in the mail have been available

for some time. Early correspondence courses included interaction with the instructor through telephone calls and mail. Television also provided a medium for teaching and learning at a distance. Students in remote areas could use the television to obtain learning content. In the late 1960s, Schramm (1962) conducted studies that compared instructional television (ITV) with classroom instruction and summarized the results of more than 400 empirical studies. The findings of his research revealed no significant difference between learning from a television or in a classroom.

As distance education progressed from correspondence courses to online learning, opportunities for interpersonal interaction also increased. Videoconferencing made it possible for learners and faculty members to interact in real time. With the emergence of the Internet, particularly email and the World Wide Web, it became possible to promote high degrees of interaction using mainstream technology and cost-effective learning environments.

Following Schramm's (1962) conclusions that there was no significant difference in learning between the traditional classroom and televised learning, researchers compared classroom instruction to other methods of distance education. Numerous studies comparing traditional classroom-based instruction with technology-supported instruction have found no significant difference in critical educational variables, such as learning outcomes. Wetzel, Radtke, and Stern (1994) summarized the results of comparative studies conducted through the mid-1990s and found no significant differences in learning outcomes between the two learning environments. Thomas Russell (1998) at North Carolina State University studied hundreds of sources of written material about distance education and concluded that the learning outcomes of students in the traditional classroom are similar to those of students in distance technology classes. This was termed the *no-significant-differences phenomenon*.

The American Federation of Teachers and the National Education Association commissioned the Institute of Higher Education Policy to conduct a review of the current research on the effectiveness of distance education (Merisotis & Phipps, 1999). Merisotis and Phipps (1999) reviewed studies published in the 1990s and presented "What's the Difference: A Review of Contemporary Research on the Effectiveness of Distance Learning in Education." The findings were that online students tend to perform as effectively as traditional students. Online students had similar learning experiences and were as satisfied with their learning

experiences as were traditional classroom learners. The authors noted several shortcomings in the original research: lack of control for extraneous variables, lack of randomization of subjects, questionable validity and reliability of instruments used to measure student outcome and attitude, and no control for reactive effects, such as the impact of motivation and interest, because taking a course online is a novelty. The authors suggest that because of these shortcomings, the study was inconclusive. The question—what is the best way to teach students—prevailed (Merisotis & Phipps, 1999).

This led to the investigation of other variables, such as overall course satisfaction, course organization, and attainment of class objectives. Leasure, Davis, and Thievon (2000) looked at these variables in traditional lecture and distance-based instruction and reported no significant differences. Allen, Bourhis, Burrell, and Mabry (2002) conducted a meta-analysis and found no differences in satisfaction levels but found a slight preference for traditional face-to-face courses over distance-based education courses.

Researchers began to move beyond comparative studies and into other methods, such as discourse analysis and in-depth interviews. These methods have provided theoretical frameworks for practice. Billings (2000) suggested a model that focuses on the best practices that included technology, faculty, students, and outcomes. The author developed examples of evidence for the best practices in the model. For example, evidence for the technology best practice is infrastructure that includes access to the Internet, course management software, user support, and appropriate hardware and software.

While the guiding principles of quality practice were under development, universities were struggling with what Noble (1998) calls automation. According to Noble, "automation—the distribution of digitized course material online, without the participation of professors who develop such material—is often justified as an inevitable part of the new 'knowledge-based' society" (Noble, 1998, p. 1). The University of California at Los Angeles (UCLA) instituted the Instructional Enhancement Initiative, which mandated that all arts and sciences courses have a web-based delivery component. The university collaborated with private corporations and formed its own for-profit company (Noble, 1998). Noble says, "It is by no accident that the high-tech transformation of higher education is being initiated and implemented from the top down, either without any student and faculty involvement in the decision-making or

despite it" (Noble, 1998, p. 2). Although faculty members and students were opposed to the initiative, UCLA administrators continued with their plans (Noble, 1998). Further, Noble cites a reason for the decision to continue—the fear of being left behind in an academic trend he calls "the commercialism of higher education" (Noble, 1998). The function of the university is to teach, and universities are developing their course-ware into marketable, sellable products in hopes of getting "a piece of the commercial action for their institutions or themselves, as vendors in their own right of software and content" (Noble, 1998, p. 5). The concern of faculty members is the quality of education. They view web-based instruction as commoditizing education, and the fear was that the quality of instruction will be compromised by automation.

Online courses and programs grew from 1999 to 2001 through grants awarded by the Department of Education called Learning Anytime Anywhere Partnerships (LAAP) for innovative distance learning projects that included partnerships. With funding from President Bill Clinton's Fund for the Improvement of Postsecondary Education, LAAP received $10 million in 1999, $23.3 million in 2000, and $30 million in 2001. Even with the phasing out of the program, the emphasis on partnerships in projects continued to grow (Carnevale, 2001).

What Is an Online Course?

The original purpose of the web was to communicate and share information. The development of the web dramatically changed the methods of communication and sharing information and ultimately changed the practice of education. Online learning is instructor moderated, instructor taught, and instructor mentored, yet student self-directed. An online learning environment can comprise large discussion groups, small group discussions, individual activities, group activities, and various levels of interaction between and among students, faculty, and the content. Content dissemination includes a variety of strategies, including video casting, audiotaping, films, and links to the web, charts, graphs, statistical data, formulas, and case studies. Interaction can be synchronous (real time) or asynchronous (delayed). Synchronous interaction means having a live discussion online, where the faculty facilitator and students can hear and/or see each other in real time. Asynchronous communication entails leaving messages at specific posting sites that others in the learning environment can read at their convenience, such as discussion boards, blogs, and wikis.

Online learning environments comprise individual courses, groups of courses, and entire programs. The degree of Internet use in a course ranges from supplementing classroom learning to courses/programs that are completely online. Online learners can attend traditional universities, such as Pennsylvania State University (www.worldcampus.psu.edu), or virtual universities, such as California Virtual University (www.cvc.edu). In addition to online courses and programs, online journals are available that focus on teaching and learning online, such as the *Online Learning Journal.* There are professional organizations that provide resources for online teaching and learning, such as EDUCAUSE (www.educause.edu) and the Online Learning Consortium (onlinelearningconsortium.org). Some courses can be taken online free of charge at websites such as Coursera (www.coursera.org).

Why Take a Course Online?

There are several reasons for taking a course online. One is that our students are digital natives. They grew up using smartphones, laptops, and tablets and viewing YouTube videos and playing games. Social media is an integral part of their communication and interactions. Online learning is an extension of day-to-day activities to learning activities. The second is the flexibility and pace of learning in online environments. Students can work, have families, continue with their home lives, and be able to learn anytime and anywhere. The third reason is the impact of technology on learning. Online learning environments allow for the use of technology to enhance learning that is creative with the ability to include learning strategies to meet differing learning styles.

There are both advantages and disadvantages to online learning. The advantages are:

- Accessible 24 hours a day and 7 days a week
- Accessible anywhere with Internet access
- Learning is student centered
- Access to resources and links on the Internet
- Opportunities for high-quality interactive dialogue

The disadvantages are:

- Need to be computer literate
- System failures

- Need hardware and software
- Learning style of student may not match online learning

Who Is Learning Online?

Student enrollment in distance learning classes has increased for the 14th year. This accounts for 15% of students taking only online courses and 17% of students taking some courses online. A recent meta-analysis by the U.S. Department of Education found that students perform better in online learning environments. A key contributor to success is the flexibility of learning online. The student can determine the time and place to learn (Seaman et al., 2018). Students think that online learning is as good as or better than traditional classroom learning (Schaffhauser, 2018).

Where Are Learners Learning?

Students are learning in fully online programs in which they take all the courses in the program online, in programs in which they take some courses online and some courses in traditional classrooms, and in blended courses in which some of the course is online and some is in a face-to-face setting.

Learning online also takes place in environments that are nontraditional. The foundational theory of education and the processes of teaching are the same in these settings as in traditional environments. What changes is the structure of the learning environment. A need for a change in structure stems in part from the cost of education and employment opportunities. About 60% of employment positions require education beyond high school (Young, 2018). Tuition is rising, and this cost can be a barrier to enrolling and graduating from a degree program. These have led to alternative structures in education. One is competency-based learning, which focuses on the mastery of academic and performance skills. Learning is personalized and individualized and self-paced and is evaluated through performance. The learner earns recognition or credit by performance that validates mastery. Descriptions of some of the alternative structures follow.

Coursera is an organization that offers quality online courses that are accessible and affordable.

MOOCs are massive open online courses. They are new pathways to higher education. Students register for an online course without

enrolling in a university or a program. MOOCs are accessible online and are cost-effective. MOOCs connect learners globally who learn and share in online environments. EdX is yet another platform that offers free courses but charges for certificates (Skiba, 2017).

Badges and microcredentials are indicators of achievement of learning. For example, EDUCAUSE awards badges when a learner completes a program.

Stackable degrees are certificate programs that when completed can be added to other certificates so that a degree program can be developed.

Who Is Teaching Online?

Although students are enrolling in online courses and administrators support online learning, faculty attitude of teaching and learning online has not significantly changed. About 9% of faculty educators surveyed by Inside Higher Ed (Jaschik & Lederman, 2014) strongly agreed that students have an equivalent learning experience online, and 83% responded that online courses are of a lower quality than traditional courses. About 33% responded that they have taught an online class.

How Do Students Learn?

Chickering and Ehrman (1996) used the American Association for Higher Education (AAHE) Principles for Good Practice to develop best practices to teach students in online environments and developed a paper called "Implementing the Seven Principles: Technology as Lever." The following points are the best practices and examples:

1. *Good practice encourages contact between students and faculty.*
   Students and faculty exchange thoughts and ideas more effectively and safely in online environments than in the traditional classroom. Communication becomes more intimate, protected, and connected online than in face-to-face interaction.
2. *Good practice develops reciprocity and cooperation among students.*
   Technology provides opportunities for interaction in online learning environments. Students can share their knowledge and experiences in small groups, in study groups, during group problem-solving exercises, and in activities related to learning content. For example, the learning content may be epidemiology and the epidemiologic triangle: the agent, the host, and the environment. Online students

can complete an assignment on the epidemiology of West Nile virus, describe how the infection occurs, and suggest strategies to prevent it from occurring.

3. *Good practice uses active learning techniques*.

The technology included in online learning systems provides opportunity for active learning. For example, students in an online community health nursing course are given an exercise to assess a community. Student directions include obtaining census and vital statistics data. Students then view a windshield survey video (made by the faculty). The exercise is to use both of these sources of information to formulate a summary of the key points about the community. The group posts the summary in a public discussion forum for all groups to read.

4. *Good practice gives prompt feedback*.

Technology provides many opportunities for feedback, both synchronous (real time) and asynchronous (time delayed) and via email. Defining "prompt" feedback in the course directions or in the syllabus enhances clarity. For example, the instructor might post the following message: "I will read all postings on the discussion board and post a comment to the group at the end of the week," or the faculty might post "I will answer all emails within 3 working days."

5. *Good practice emphasizes time on task*.

Time is critical, and using time wisely is important. Online courses save the students commuting time and parking costs. Students can learn anywhere—at home, at work, or virtually anywhere there is an Internet connection. A rule of thumb to determine the number of hours a week that students will spend on an online course is to double or triple the number of course credits. For example, a student enrolled in a 3-credit course can expect to spend 6 to 9 hours each week working on the course.

6. *Good practice communicates high expectations*.

Some students register for online courses because they think it will be easier than traditional courses. They soon find out that this is a fallacy. Clearly communicate expectations to students. If students are not performing at the expected level, the faculty should contact the student, describe observed behavior, and delineate expected behavior. For example, if the faculty reads a student post with comments like "I agree" or "Great idea," the faculty should contact this student. The message that "I have read your postings and see that in some you clearly express your ideas and use the literature to support your ideas, but in other postings your comments are less substantiated" or

"I read that you have excellent ideas and would like to see you share these more with your peers" is shared.

7. *Good practice respects diverse talents and ways of learning.*
   The advantage of online courses is the many resources available to accommodate a variety of learning styles. For example, for the visual learners, use PowerPoint, charts, and graphs. For audio learners, use podcasts. For readers, add notes. Links to YouTube videos and a plethora of websites can add value to the content.

Ten years after Chickering and Ehrman principles, Lewis and Abdul-Hamid (2006) updated the principles based on their quantitative study and suggested the following best practices. They are:

1. Foster interaction.
2. Provide feedback.
3. Facilitate learning.
4. Maintain enthusiasm and organization.

The first three (interaction, feedback, and active learning) remained as best practices over the years. Maintaining enthusiasm and organization is an additional best practice.

SUMMARY

Online learning environments have morphed into academia as acceptable methods for achieving academic goals in flexible and creative learning environments. Students are motivated and independent, and faculty members have changed roles from being the sage-on-the-stage (classroom teaching) to guides-on-the-side (online teaching). When considering the research findings over the past several decades along with societal changes and demand for accessible learning, it becomes evident that learning online is heading in a direction that will drive demand. As new generations grow up learning online, educators will continue to face the challenge of keeping students engaged through active learning and feedback that facilitates the learning process.

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2

The Impact of New Directions on Teaching and Learning

Carol A. O'Neil and Cheryl A. Fisher

INTRODUCTION

A variety of factors are influencing the way we teach and the way we learn. Some include the changes in demographics and geographic characteristics of students enrolling in institutions of higher education, the financial considerations of traditional education, the advances in technology, and focus on career development. Delineating these factors and their impact on higher education is the focus of this chapter.

ENROLLMENT IN INSTITUTIONS OF HIGHER EDUCATION

Enrollment in institutions of higher education has been decreasing over the past several years. In 2016, 62% of students enrolled in institutions of higher education were in 4-year schools, 36% were in 2-year schools, and 2% enrolled in schools with less than 2-year programs (Ginder, Kelly-Reid, & Mann, 2017). Enrollment decreased nationally by 0.3% from spring 2017 to spring 2018 (National Student Clearinghouse Research Center, 2018), and specifically, enrollment in 4-year public institutions decreased by 0.9% during this past year, but enrollment in 2-year institutions is expected to stay the same (Hoover, 2017).

The decrease is most prevalent in 4-year institutions that are for profit (−6.8%), in 2-year public institutions (−2.4%), and in 4-year private (−0.3%) and nonprofit institutions (−0.4%). This is the pattern in 34 states and the Midwest and Northeast (National Student Clearinghouse Research Center,

2018). Elite institutions of higher education expect enrollment increases (Grawe, 2018).

The Council of Independent Colleges have held discussions about the status of enrollment in private liberal arts colleges. The identified issues included the potential burden of decreasing numbers of high-school graduates, the financial costs, and the competition among colleges for students. Possible solutions were changing the form of mergers and shifting of programs. The council decided that one change would not fit all schools and each school needs to make the changes that will best meet their individual needs (Seltzer, 2018).

First-time undergraduate student enrollment in fall 2016 increased in 37 states and the District of Columbia and decreased in the remaining states (Ginder et al., 2017). Students enrolling in online courses and programs are increasing. About 49% of students enrolled in online courses are at for-profit institutions; 18% of students enrolled in online courses are at nonprofit institutions; and 11% are in online courses at public institutions (Ginder et al., 2017). Almost 80% live locally and within 100 miles of their school (Magda & Aslanian, 2018). About 15% of students take an online course, and of these, 17% take both land-based and online courses (Seaman, Allen, & Seaman, 2018).

FINANCIAL IMPACT

College tuition is rising. Students and families rely on scholarship funds, loans, and savings to pay tuition. Approximately 47% of undergraduate and 64% of graduate students are employed and could be eligible for tuition reimbursement, yet at least 60% do not use employment reimbursement (Magda & Aslanian, 2018). Students tend to choose a school that awards scholarship funds over those that do not (Magda & Aslanian, 2018).

TECHNOLOGY

The Horizon Report is an annual analysis of the trends, challenges, and technologies that will drive education for the next 5 years (Becker et al., 2018). Measuring learning and redesigning learning space will be the focus in the next 1 to 2 years; open education resources and multidisciplinary learning will be the focus in 3 to 5 years; and the cultures of innovation and cross institution and cross sector collaboration will be the focus over the next 5 years and beyond (Becker et al., 2018). Solvable issues are providing authentic learning experiences and improving

digital literacy. Issues that we understand, but do not know how to resolve, are adapting organizational designs to the future of work and advancing digital equity. Complex issues are economic and political pressures and rethinking the roles of educators (Becker et al., 2018).

Technology is a vehicle that teachers use to make decisions about technical and teaching strategies to effectively meet student-learning goals (Martin, 2018). One strategy is using mobile devices in teaching and learning. Over 80% of students use mobile devices for their online classes. They are accessing course material such as readings and course content, communicating with instructor and peers, and researching material for assignments (Magda & Aslanian, 2018). Gikas and Grant (2013) explored the use of mobile computing devices in higher education. They found that these devices allowed students to collaborate more effectively, which enhances engagement in communication and content creation. Educause Center for Analysis and Research (ECAR, 2017) surveyed tens of thousands of students across dozens of U.S. institutions to better understand student engagement with technology. Some of the key findings from this report noted that "laptops are king, smartphones are queen, and tablets are on the way out" (p. 5). The students identified their laptop as critical to their success, while three quarters identified their smartphone as moderately important, with the tablet functionality declining because it duplicates that of the laptop and smartphone. Another significant key finding noted that students would like instructors to use more technology in their classes, including lecture capture, early-alert systems, and search tools. These features were noted to be more desirable than features that require for the student to "give something" (p. 6) such as social media or polling tools.

Shadiev, Hwang, Huang, and Liu (2015) proposed integrating social media into conventional mobile learning to enhance collaboration through a system called m-learning. The aim of this system is to promote collaborative sharing of life experiences in nature and discussion of different perspectives. M-learning allows teaching and learning to expand beyond the traditional classroom with increased flexibility and opportunities for interaction. It is important to note that the successful integration of social media must come from a sound pedagogical approach attached to specific learning outcomes in order for this tool to be effective.

FOCUS ON CAREER DEVELOPMENT

Career development is the preparation of students for employment. We are currently in our third education revolution. The first was the

expansion of high-school education. The second is the focus on associate degree programs, and this third revolution is lifelong learning.

The First Wave: The Expansion of High-School Education

The movement to enhance education through increased enrollment in high schools occurred from 1910 to 1940. The movement was strongest in the Midwest with the highest high-school enrollments in Iowa (Goldin & Katz, 1998), and by 1935, approximately 40% of youth earned a high-school diploma. The purpose of this high-school education was a response to economic changes through broadening education to enhance the preparation for employment (Selingo, 2018).

The Second Wave: The Growth of Associate Degree Programs

The Higher Education Act signed by Lyndon B. Johnson in 1965 paved the way for the expansion of post-high-school education. Enrollment in higher education increased and more than doubled between 1970 and 2016 (Selingo, 2018).

The Third Wave: Lifelong Learning

The first two waves focused on education at a young age and early in career development. This idea is changing to the view that education and training should be continuous through life owing to the impact of automation and the necessity for staying current and competent in evolving careers (Selingo, 2018). Staying competent in evolving careers means retraining in shorter periods rather than enrolling in degree programs. This retraining will come from two sources: employers supported and individual supported. Employers negotiate the retraining with their employees. There is an emerging group of freelance workers or contractors called the "gig economy." They are self-employed and must support their own training. This group will negotiate their own retraining (Selingo, 2018).

PREPARING STUDENTS FOR WORK

An ever-changing work environment results in graduates having outdated skills. Magda and Aslanian's (2018) survey of online students

concluded that over three quarters of students registered for online courses that will enhance their careers and that they are seeking career services. Magda and Aslanian (2018) also found that 85% of students perceived education as a return on their investment. Employers tend to see the need for an innovation before educators are aware of them. When employers cannot initiate the needed innovation, friction results (Tishma, 2018). When educators focus on teaching the basic, most needed skills, the friction decreases, thereby resulting in employers and employees feeling more prepared for the work environment (Tishma, 2018). Employers report that maintaining the skills needed to perform a job is one of their top priorities.

Employers believe that the role of postsecondary education is to prepare students with the skills needed in their careers. In addition, a focus on "soft skills" should be provided. These are skills that will guide the student through the workplace after graduation and include critical thinking, resiliency, and communication (Arnett, 2018).

The literature supports a changing trend in the labor market due to technology. Trends in manufacturing are moving toward artificial intelligence and automation. In artificial intelligence and automation, machines complete tasks that have predictive patterns, such as driverless cars. Jobs lost to computerization can result in technological unemployment. Frey and Osborne (2013) studied the impact of these trends and found that 47% of the U.S. employment might be impacted by automation. A Gallup investigation at Northeastern University (Gallup Northeastern University, 2018) found that about 76% of those surveyed thought that artificial intelligence would impact their employment.

Jobs most likely influenced by artificial intelligence, called jobs with high automation risk, start at Point A and go to Point B. The functional tasks from point to point are predictable, thus allowing for the programming of machines to perform the tasks (Loeffler, 2018). Some of these jobs include telemarketing, retailing, administrative services, and transporting material (Frey & Osborne, 2013; Loeffler, 2018). Jobs at low risk for automation include organizational chief executives, recreational therapists, emergency management supervisors, creative and artistic workers, jobs requiring high levels of social intelligence, jobs requiring problem-solving and ingenuity, computer hardware engineers, mechanical engineers, and architects (Frey & Osborne, 2013; Loeffler, 2018). These jobs require social intelligence and problem-solving skills that are not yet amenable to programming a machine.

Most think that artificial intelligence and automation will make a positive difference but also think that jobs will be eliminated and retraining will be important. Most see this training as coming from their employer in the form of workshops and credentials (Gallup Northeastern University, 2018). However, this trend is creating a movement toward alternative learning environments that support creative and flexible ways to learn.

ALTERNATIVES TO VALIDATE LEARNING

One suggested flexible authentication of learning skills is competency-based education (CBE), which focuses on gaining competence rather than taking courses. Magda and Aslanian (2018) surveyed online students about CBE, and although students are more familiar with this approach, about 50% are interested and would like more information. Some institutions have combined the flexibility of an online CBE model with a project-based approach to real-world projects. One project-based CBE model was described by Ye, Van Os, Chapman, and Jacobson (2017) based on three value propositions: (a) identifying competencies that support program learning outcomes, (b) including project assignments that demonstrate mastery of competencies, and (c) coaching faculty to facilitate student performance in achieving mastery of competencies. With the growing demand for educators to prepare graduates for the work setting, work readiness has become a growing concern for employers. Once students have validated learning and demonstrated newly learned skills, they can earn certificates and combine them into stackable degrees. Magda and Aslanian (2018) surveyed online students and found that 95% were interested or very interested in the concept.

The stackable credential evolved over time from the part-time student taking one course at a time to eventually earning enough credits toward a degree. One of the problems with this approach is that taking courses for credit one at a time is inefficient; programs change in requirements over time, and they often do not map skills and competencies to a credential outcome (Jones-Schenk, 2018). Microcredentialing is a certification indicating a demonstrated competency in a specific skill. The new knowledge is not necessarily following a specific order or pathway but may generally fall into one of three models: vertical stacking, horizontal stacking, or value-added stacking (Hanover Research, 2017, p. 3). Vertical stacking refers to the more traditional method of stacking (or mapping)

credentials into an academic credential or degree. Horizontal stacking is more about adding skills within a credential level. Value-added stacking focuses on adding skills or expertise for individuals who already hold an academic credential. These models have different applications for workforce development, both in developing new pipelines of workers and in developing expanded talent within incumbent workers. Today's stackable credential strategy attempts to combine the benefits of both the degree-related education and continuing education by mapping and stacking learning outcomes.

In the concept of textbook-free courses, textbooks are replaced with course material. Magda and Aslanian (2018) surveyed online students and found that about 50% of students are in favor of such an approach. As access to open resources continue to increase along with the cost of textbooks, textbook-free courses are becoming an attraction for many academic institutions. This approach allows for more opportunities for exploration and best practices and lessons learned from true experiences. Some of the reasons for movement in this direction include:

- The cost of textbooks for college students has increased 812% since 1978.
- The cost of course materials sometimes forces students to withdraw due to the additional financial burden.

Use of open educational resources (OER) allows faculty members to teach key concepts via lecture, ebook, and other means versus relying on reading concepts in a textbook. Some practical approaches can be used to design a course using video and other resources instead (Center for Teaching and Learning, 2016), for example, developing a set of learning resources, developing appropriate course assessments, fostering independent student exploration and research, and building on students' self-directed learning skills.

Although it may be difficult to think of a course without a textbook, new opportunities for exploration and application of content can now be considered.

THE IMPACT OF TECHNOLOGY

The impact of technology on education cannot be predicted, but educators cannot continue to exclusively teach using traditional methods. Educators

must be agile, flexible, and responsive to the changing environment and needs of the learners (Hoover, 2017). Additionally, educators must be aware of the impact of technology on society and the changing needs of the learners. New opportunities continue to emerge for communication and collaboration in online classrooms, which has proven over time to be critical to learning. Technology is a powerful tool that can support and transform education in many ways, enabling new ways for people globally to work and learn together. Educators and instructional designers must work together to make the most of the opportunities provided by technology in order to continue making education efficient and available to everyone everywhere.

SUMMARY

With rapid change occurring in technical advancements from mobile devices to social media, educators have the opportunity and challenge to creatively design new educational environments that meet student needs. The rising cost of college degrees and textbooks have forced a shift in how future employees obtain education based on acquisition of skill. Employers themselves are looking for people ready to enter the workforce and participate in continued learning to maintain skill levels. All of these factors together have created a new way of looking at education which is taking on the shape of a traditional college education and continuing education.

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