E-Learning Applications for Career and Technical Education

Technologies for Vocational Training
Handbook of Research on E-Learning Applications for Career and Technical Education: Technologies for Vocational Training

Victor C. X. Wang
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Volume I
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### Section I

#### E-Learning Applications for Career and Technical Education

**Chapter I**

Utilization of Distance Education in Career and Technical Education (CTE) Teacher Education

*Chris Zirkle, The Ohio State University, USA*

*Edward C. Fletcher Jr., The Ohio State University, USA*

Distance learning opportunities have rapidly burgeoned in educational environments across disciplines. The result of its growing use has been felt by the career and technical education (CTE) teacher education community. This chapter examines the literature and implications regarding the implementation of distance education in the delivery of CTE teacher preparation programs, along with the issues and challenges it brings. First, a brief historical account of distance education in institutes of higher education is provided. Secondly, a review of the research on distance education’s presence in (CTE) programs is discussed. Thirdly, future trends are articulated for CTE teacher educators, CTE teacher candidates, and CTE researchers.

**Chapter II**

Designing Automated Learning for Effective Training and Skills Development

*Shalin Hai-Jew, Kansas State University, USA*

This chapter explores automated e-learning for training in career and technical education (CTE). This addresses the foundational pedagogical theories, various applied technologies, the selection of learning contents to automate, various sequencing strategies, pedagogical agentry and intelligent tutoring agents, and human-centered mitigations to enhance this learning. Games and simulations are a special kind of
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Lesley Farmer, California State University, USA

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Using Technology to Reintegrate Learning and Doing: IBM’s Approach and its Implications for Education ............................................................. 59

Chris Allen Thomas, University of Pennsylvania, USA

“Learning” has classically been subdivided into education and training. Whereas education occurs in classroom-type settings and takes one away from work, the vocational nature of training means that much of the learning goes on in the process of work or preparing for work. In addition, pressures arising from globalization and the transition from a manufacturing-based to an information-based economy have led to an increased need to train our workforce. In order to survive and remain competitive in this changing landscape, companies such as IBM have over the past two decades taken a renewed look at learning and embraced technological innovations that allow training to dovetail seamlessly into work. This chapter looks at some of the learning solutions IBM has developed to meet these challenges. The solutions have implications for how we as a society view the construct of education.

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Davison M. Mupinga, Kent State University, USA
George R. Maughan, Indiana State University, USA
Today’s career and technical education (CTE) teachers and trainers are subjected to a number of challenges caused by work systems and processes that are science and technology-based. Furthermore, the advent of information and communication technologies (ICT) and characteristics of Millennial students has greatly influenced their roles. This chapter examines the impact of ICT and influence of today’s students on the role of the 21st century CTE teachers and trainers. The chapter describes information and communication technologies, application of ICT in education and training, characteristics of millenium students; contextual challenges and role changes for today’s teachers and trainers, and provides suggestions to integrate ICT with instruction.

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Applying learning technologies to improve the current practices of CTE requires a more holistic view focusing not only the aspect of learning but also the transfer needs of CTE within educational institutions and private sector organizations. In an effort to address the need for using technology appropriately for CTE, the authors provide a conceptual framework that synthesizes the literature of learning technologies and learning transfer within CTE. This chapter has the following sections: (1) developing learning content for CTE; (2) learning frameworks and instructional strategies for learning transfer within CTE; (3) key considerations for utilizing learning technologies for CTE; and (4) future trends of CTE in using advanced learning technologies.

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Ed Powell, Anglia Ruskin University, UK

This account of a research project explores postgraduate in-service teachers’ understanding and facilitation of active learning in primary, secondary and higher education in the United Kingdom. Qualitative data were elicited from six teachers during 2003-2004 using video-stimulated reflective dialogues of classroom practices illustrative of active learning. Outcomes of 18 dialogues have been taped, transcribed and analysed. The dialogues have begun to reveal teachers’ thinking, feelings and actions as facilitators of active learning. Findings, which are presented as case studies, indicate that teachers associate active learning, among other things, with learner autonomy, empowerment, developing higher order thinking skills and cooperative group activities. Increasingly, teachers devolve the locus of control of learning to their learners with appropriate guidance, monitoring and interventions. Classroom practices reflect an emphasis on discourse between learners and with teachers, guided discovery learning and learning as an essentially social process. The evidence suggests that video-stimulated reflective dialogues are an effective method for revealing teachers’ tacit knowledge about their pedagogy. Video-stimulated reflective dialogues emerge as a highly effective professional development tool which can enhance teachers’ career progression as they acquire and apply sophisticated higher order thinking skills in relation to their pedagogies.
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Shalin Hai-Jew, Kansas State University, USA

Using live, synchronous time effectively in an instructor-led e-learning course requires a clear understanding of the dynamics of real-time, live interactivity. Synchronous interactivity enables live learning, demonstrations, collaborations, lab simulations, human-driven simulations, desktop simulations, live multi-data-stream events, and plenty of valuable learning and training. These may include webinars, online conventions, chat sessions, interactive television, and interactive lectures in CTE. These synchronous events may be non-human-facilitated or human-facilitated. To maximize synchronous time requires pedagogical preparation and the training of participants, setting the pace, troubleshooting technological challenges, and striving to create accessibility pre-, during- and post-event. This chapter will address some strategies for using live sessions in career and technical education to optimize the synergies of real-time.

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Lesley Farmer, California State University, USA

Increasingly, people are seeking distance education delivery options in order to get the vocational training needed from experts who may reside continents away. Therefore, vocational educators need to address and accommodate cultural realities. Hofstede’s model of cultural dimensions provides a framework for examining culturally-sensitive vocational training implications. Culturally-impacted issues and solutions
are explained relative to the relationship of vocational training to the workplace, and to online teaching and learning. Specific strategies are suggested to address language barriers, student-teacher relations, choosing resources, learning activities, technical issues, and assessment.

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Ian Gordon, Colorado State University, USA
Don Quick, Colorado State University, USA
Linda Lyons, Colorado State University, USA

This chapter provides an alternative approach to career and technical education (CTE) and the use of e-learning technologies. The authors suggested that, by shifting their emphasis in education from the development of people to meet occupational and economic needs to the development of people as individuals, they may become more successful in meeting occupational and economic goals. Based on lifelong learning, the authors concentrated on experiential learning, critical reflection, transformative learning, and learning communities as best educational practices. Having established the pedagogical basis for lifelong learning, they will then focus on the impact of e-learning and how it can be used to foster and develop these practices. The authors then discuss how these technologies can be used to help create lifelong learners and a learning society. They conclude with a discussion of two groups of CTE learners and how the use of e-learning technologies may help meet their learning, career and life goals.

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Simona Marchi, University "Sapienza" of Rome, Italy

Learning processes depend on the socio-technical and regulatory contexts in which professional practices and daily usage take place. These processes develop out of and through various systems of activities, consisting of subjects, artefacts, rules, knowledge, and roles. What happens when the rules governing these systems, the roles, artefacts and knowledge change? For instance, what happens to learning processes when the settings in which practices take place are virtual, when they occur, say, in a blog, or in a community, or on a social networking platform? In this chapter the authors intend to examine in detail the specific features of learning processes taking place in these new online environments.

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Iris M. Saltiel, Troy University, USA
Maria Martinez Witte, Auburn University, USA
James E. Witte, Auburn University, USA

Supervising projects and dissertations within Career Technical Education requires a complimentary medley of skills, strategies and technologies appropriate for the intended learning outcomes. As the communication mechanism has evolved – the task has changed. The interpersonal dynamics of supervision conducted through electronic means is more complex and intricate. Technology presents challenges on
behalf of both faculty and students engaged in a project or dissertation. Difficulties for faculty include the time technology takes to use, and adapting class materials that do not count towards promotion or tenure. Student concerns include not having the right technological equipment and being isolated. Faculty supervising projects and dissertations are using more innovative strategies such as online resources and working with students in groups.

Chapter XV
Fostering Online Communities of Practice in Career and Technical Education

Lesley Farmer, California State University, USA

Career and vocational educators (CTE) need to find ways to foster online communities of practice (CoP) in order to optimize learning and application of knowledge to real workplaces. Not only do students engage more actively in their learning, but they gain from multiple perspectives, and can develop more complex projects with the help of others. Instruction needs to be designed to help students get to know each other, and collaborate. Technological tools can facilitate such interaction, overcoming time and space issues. Particularly as Web 2.0 tools facilitate collaboration, online CoPs can thrive. Nevertheless, equity issues of physical and intellectual access need to be considered when creating such online learning environments.

Chapter XVI
Integration of Human Resource Management Knowledge into Career and Technical Education

James E. Bartlett II, North Carolina State University, USA
Michelle E. Bartlett, HRD Leader, USA

Career and technical education (CTE) occupations require highly skilled workers. This workforce must possess very specific technical skills. In addition to the technical skills, these professionals need to possess knowledge, skills, and abilities for the workplace that are non-technical in nature. To ensure students have this non-technical preparation, core interpersonal skills and business components are needed in the CTE curriculum. The integration of human resource development and management (HRD & M) concepts in CTE can develop these skills. Understanding the human resource (HR) component provides those entering CTE professions a better systems view of the organization and how the organization functions outside of their own technical area. Additionally, the understanding and knowledge of core HR components, that are not technical skills, are needed when human resource functions are integrated into technical job roles. When entering the workforce new professionals will need to perform HR functions. Often times CTE students are not highly prepared for non-technical skills in their CTE education. Therefore CTE should have HR concepts integrated into the curriculum so graduates are prepared to successfully implement the education they received into a workplace setting. With this in mind, this paper seeks to provide an overview of HRD & M concepts, discuss how HRD & M are integrated into the work roles of those entering CTE professions, and show how these concepts can be integrated into CTE courses.

Chapter XVII
Federal Funding for Career and Technical Education

Marietta A. Webb, Academic Success Center, USA
Federal funding for career technical education (CTE) programs is critical to the expansion and success of training a skilled workforce to meet the needs of labor markets. The Morrill Act of 1862 was the first federal law to provide support to build agricultural and mechanical colleges and universities. Federal support continued through the decades with Perkins IV being the current legislation with funding guidelines for CTE programs. Today’s educational systems are faced with the task of providing rigorous and relevant educational programs with the mission of developing productive citizens capable of competing in a global society. This mission cannot be accomplished without continued federal funding support.

Chapter XVIII
Facilitating Scholarly Discussion Boards for Human Resource Education

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James E. Bartlett II, North Carolina State University, USA
Michelle E. Bartlett, HRD Leader, USA

Distance education is continuing to grow in popularity in postsecondary education. Over 75 percent of community colleges are offering some form of distance career and technical education (Johnson, Benson, Duncan, Shinkareva, Taylor, & Treat, 2004). While there are a variety of ways to deliver distance education instruction, the Internet has become the mostly widely used communication channel. There is an array of educational technology tools that allow instructors and students to communicate synchronously and asynchronously. Discussion boards, an asynchronous tool, are being used widely in a variety of courses. This chapter addresses how to facilitate scholarly discussion boards for human resource education.

Chapter XIX
Building a Holistic Foundation for Leadership and Management through Online Learning

Sharon G. Juozapavicius, CCHASM, USA

Leadership and management, in their truest state, represent a compilation of knowledge gained through the entire spectrum of experiential learning. While these terms are familiar as unique and individual entities, in today’s global economy they are inexorably linked and increasingly essential. The paradigms of a Novice Leader/Manager and Leader/Manager are discussed along with the communication and acquisition of essential knowledge areas and skill sets via e-learning. Explored are three key areas: the importance of building a holistic foundation for the individual’s role as a Leader/Manager, the essential journey the student, as a Novice Leader/Manager, must take to ferret out and enhance his/her own ability to recognize and close gaps in personal Leader/Manager development, and pathways to guide and support the student’s discovery and transition from difficulties and pitfalls to operating at a point of top level skills and interaction via long distance online learning.

Chapter XX
Innovative Strategies for Preparing and Developing Career and Technical Education Leaders

James E. Bartlett II, North Carolina State University, USA
Michelle E. Bartlett, HRD Leader, USA
Leadership development in career and technical fields is important; therefore, this chapter examines innovative techniques for preparing and developing career and technical education leaders. Synchronous and asynchronous techniques are described in detail. Emerging non-traditional leadership programs using innovative techniques are highlighted. Tools such as internships, job shadowing, virtual classrooms, innovative mentoring techniques, and distance technology sources are explored. Advantages of time, cost, and access are discussed. Lastly, disadvantages of technology use, future trends and conclusions are provided.

Section II
E-Learning Applications for Adult Learning and Career and Technical Education

Chapter XXI
Speaking of Technology: Teaching English Language Learners in CTE Programs

Victor M. Hernández-Gantes, University of South Florida, USA
William Blank, University of South Florida, USA

Meeting the needs of English language learners (ELLs) in career and technical education (CTE) represents a growing challenge for all teachers in the field. The challenge is especially overwhelming given the widespread agreement that teachers are not well prepared to meet the needs of ELLs. The implications for schools and CTE teachers are discussed in connection to appropriate instruction for ELLs addressing language development considerations. The underlying premises of effective instruction aligned with contextual teaching and learning, relation to teaching practice in CTE programs, and the implications for using technology to facilitate ELLs’ learning are also examined.

Chapter XXII
Cohort Programming

James E. Witte, Auburn University, USA
Iris M. Saltiel, Troy University, USA
Maria Martinez Witte, Auburn University, USA

This chapter examines the use of cohort programming within the Career Technical Education field. Cohorts are ideal formats for CTE curricula since students participate in the majority of coursework together. They provide mutual academic and intellectual encouragement and reinforce the transfer of skills to the workplace. Developing cohorts within an online electronic teaching and learning environment is addressed at formal and informal levels. Instructing and facilitating in an e-learning environment requires the effective use of technological tools, which are overviewed in this chapter. Also addressed are instructor challenges and methods that will continually evolve as technological advances occur. Cohort programming is an innovative and practical way of enhancing student economic opportunities and creating lifelong learners.

Chapter XXIII
Impact of E-Learning on Adult Education: A Changing Postmodern Approach

Royce Ann Collins, Kansas State University, USA
Jeff Zacharakis, Kansas State University, USA
In the present consumer educational market, educational institutions are rapidly incorporating more online opportunities. The various issues that learners and instructors cope with are addressed from the literature and our adult students. The key issue is creating a quality learning experience for adult students. Not only does the instructor need to incorporate what we already know about adult learning, but they must also approach the course development with a constructivist mindset. The major force in creating a quality learning experience is the discussion generated. Instructors must assist students in creating their own knowledge and develop the ability to discuss in a virtual environment.

Chapter XXIV
Trends and Lessons from the History of Contemporary Distance Learning ........................................ 297
Kathleen P. King, Fordham University, USA

This chapter provides an overview of the history of the rapidly changing field of distance learning with a focus on trends and lessons for contemporary developments. Beginning with central concepts of distance learning, the chapter traverses the span of developments and technologies on a high level. At a time when it is no longer a matter of whether learners should engage in distance learning, but when, it is vital to address selected issues, controversies, and problems facing the field. The chapter presents topics of solutions, recommendations and future trends, problem based learning, delivery models, and assessment.

Chapter XXV
Understanding Group Interaction and Knowledge Building in Virtual Learning Environments ...... 312
Hwee Ling Lim, Petroleum Institute, UAE

With the rapid adoption of online learning and training, educators have drawn different conclusions regarding the viability of e-learning in supporting interactions that result in quality learning experiences and outcomes. This chapter describes several main online educational interaction models, highlights the Community of Inquiry model for contextualizing interaction from a sociocultural constructivist perspective and explains the characteristics of virtual learning communities. This chapter advances current understandings on online group learning processes with findings from a case study on distant students’ experiences during virtual synchronous tutorials. Quantitative and qualitative survey results are presented on student satisfaction with the development of their skills in computer-mediated communication, increased understanding of course content, and enhancement of their overall e-learning experience through collaborative group discussions. Finally, the implications of the findings for designing distance courses and virtual group learning activities are discussed, and recommendations offered to enhance student experiences of online group learning.

Chapter XXVI
Using E-Learning to Increase Opportunities in CTE and Adult Education: Integrating Face-to-Face with Two-Way Interactive Video Instruction for Career and Technical Educators ...... 329
Linda Lyons, Colorado State University, USA
Don Quick, Colorado State University, USA
Ian Gordon, Colorado State University, USA
Faced with the challenge of training Career & Technical Educators (CTE) in rural areas, we developed a hybrid delivery system that would minimize and condense face-to-face instruction, while integrating distance components through the use of two-way interactive technology and an online course management system. The program described in this chapter is for new teachers, designed to model classroom teaching techniques, methods of delivery, and best teaching practices. The online components combined with the two-way interactive system give new teachers the opportunity to share ideas and issues with the whole class, either face-to-face or online. This model is based on the premise that the new teacher will also obtain many teaching skills by being actively engaged in the teaching process, guided by a capable mentor at her site. The purpose of this chapter is to unveil an e-learning model that accommodates distance students, especially those in the teaching profession.

Chapter XXVII
Barriers to Adult Learning .............................................................. 341

Maria Martinez Witte, Auburn University, USA
James E. Witte, Auburn University, USA
Iris M. Saltiel, Troy University, USA

There is a growing need for an educated, skilled workforce that is able to learn and adapt to new challenges. Expecting this need to be met by those graduating from high school is not realistic as the current educational system has not adequately served the non-traditional student. This chapter reaffirms that Career Technical Education programs are excellent ways to meet adult learning and workforce development needs. The challenge, as described in the chapter, is to engage adults in becoming lifelong learners. This will require removing barriers to adult learning that relate to cost, accessibility, and interest. State and federal leaders also have a stake in addressing this need as it affects the nation’s ability to compete on a regional and international level.

Chapter XXVIII
Cultural Issues in Adult Education ................................................. 356

Sandra Poirier, Middle Tennessee State University, USA
Deborah Wooldridge, Bowling Green State University, USA

Adult educators internationally are being asked to transform the pressures of cultural diversity in their classrooms into opportunities for all learners in the Information Age. Good teachers not only convey a body of knowledge to their students, but they are also aware of how to convey that knowledge by connecting their own experiences with their students’ experiences of the world. Only by the instructor understanding and respecting the students’ language, culture, and knowledge will students be able to achieve optimal academic success to build their future. The challenge today for all adult educators in building educated societies is to become culturally competent where ethnically diverse students are taught through their own cultural and experiential lenses throughout life and through many diverse educational pathways.
Chapter XXIX
Lifelong Learning in the 21st Century

Kathleen P. King, Fordham University, USA
Sharon R. Sanquist, Caldwell College, USA
Seamus King, University of Georgia, USA

Learning in the 21st century no longer ends with K-12 and college preparation. Instead, for those adults who will succeed in negotiating the demands of the 21st century, it must continue across their lifetime. More than merely a focus on lifelong learning, however, this chapter illuminates the specific needs and skills of lifelong learning integrated with life and work in the 21st century. The discussion of modern skills includes scope, definitions, issues and trends, current and emerging practices, recommended strategies, and a glimpse of the future. The cornerstones of this discussion include approaches to learning such as lifelong learning, self-directed learning, 21st learning skills, information literacy, collaborative, situated, and problem based learning.

Chapter XXX
Key Aspects of Teaching and Learning in the Online Environment

Sandra R. Daffron, Western Washington University, USA
AJ Barse, Western Washington University, USA
Edward Webster, Western Washington University, USA

Delivery of Postsecondary Career and Technical Education (CTE) classes by distance learning has increased dramatically in the last decade as students and workers strive to juggle busy work schedules, school, and family obligations. The trend to offer CTE classes by distance education, especially by e-learning (delivered through electronic means) is rapidly increasing requiring instructors in the face-to-face classroom to make a quick transition to e-learning. Instruction by e-learning requires different practices, theories of teaching, design models, and methods of delivery. The key aspects of teaching and learning in the e-learning environment are discussed with scenarios for application.

Chapter XXXI
An Integrated Evaluation Approach for E-Learning Systems in Career and Technical Education

Wenhao David Huang, University of Illinois at Urbana-Champaign, USA
Steven R. Aragon, University of Illinois at Urbana-Champaign, USA

As e-learning is gaining popularity in higher education, its evaluation becomes more critical than ever, to ensure the achievement of intended learning outcome. The effectiveness of e-learning system evaluation under current practices, however, remains questionable. One reason for such uncertainty is the lack of direct measurement while learning occurs since most evaluation data is collected after the learning process. Thus this chapter proposes an integrated evaluation approach for e-learning systems based on cognitive load theory and grounded in the 4C/ID-model. Both direct and indirect measurements will be deployed in the integrated approach in the context of cognitive load. Furthermore all evaluation data can be translated into practical e-learning design solutions by triangulating with the 4C/ID-model. This chapter also suggests that future evaluation framework on e-learning should include factors from attitudinal and social aspects of learning process.
Chapter XXXII
CTE Distance E-Learning Application: A Learner-Centered Approach

*Brenda C. Ledford, University of Maryland University College, USA*

E-learning application within distance contexts is growing rapidly as a solution to the demands and needs of CTE learners in the 21st century. Effective and sustainable application begins with understanding the connective relationship e-learning enjoys with distance education. In conjunction with this link, pedagogical theory and practices successfully utilized within distance education are of relevance to CTE educators and practitioners if successful application is to be attained. This chapter delves into the prominent theories and practices of distance education centered on a learner-centered approach. Also discussed is the changing role of the instructor and learner within this pedagogical approach. Although challenges and barriers emerge with change strategies, CTE has distinct advantages for successful transition and application. Central to the learner-centered approach is the characteristics and capabilities of Web 1.0 and Web 2.0 technologies which continue to regulate and necessitate consideration of the learner-centered approach within distance contexts.

Chapter XXXIII
Using and Evaluating Learning Objects for Online Courses in Vocational Education

*Simone C. O. Conceição, University of Wisconsin-Milwaukee, USA*
*Elaine Strachota, Milwaukee Area Technical College, USA*
*Steven W. Schmidt, East Carolina University, USA*

The use of learning objects, such as videos, interactive games, and tutorials, has become increasingly popular in online vocational education. Used to reinforce concepts, to allow students to review subject matter, and to help students become more adept at procedural tasks, learning objects can enhance learning in online environments. This chapter presents an overview of learning objects, framed in a study that resulted in an instrument that can be used for student evaluation of learning objects. Also included is a discussion of the future of learning objects in online vocational education.

Chapter XXXIV
Self-Assessment in Building Online Communities of Learning

*Karen Weller Swanson, George Mason University, USA*
*Mary Kayler, George Mason University, USA*

The incorporation of self-assessment techniques and opportunities within the online learning process can enhance student learning and support the development of self-directed learners. Formative assessment (evaluation of learning in process) enables students to take ownership of their learning and to also evaluate their learning in relationship to required course goals and objectives. Formative assessment use within online learning communities works to create strong communities of practice (student learning in relationship with peers); a constructivist orientation towards learning. Accountability for learning in conjunction with peers can support and advance student learning experiences, encourage active engagement, and provide authentic experiences that advance students’ understanding of their own developmental framework and the transformative nature of learning theories.
Chapter XXXV
Access Barriers Experienced by Adults in Distance Education Courses and Programs

Chris Zirkle, The Ohio State University, USA
Edward C. Fletcher Jr., The Ohio State University, USA

The proliferation of distance education components to courses and entire programs at institutes of higher education have been the focus of discussion within the last decade. Educational constituents have sought to explore the implications of distance education practices on teaching and learning. The purpose of this chapter is to examine the literature on barriers to access, particularly for adult learners, in distance education programs and courses. Prior to discussing access barriers, a brief history of distance education is articulated. Further, strategies that individuals or institutions utilize to overcome these barriers are presented. Concluding the chapter are trends and issues shaping the future landscape of distance education.

Chapter XXXVI
Glad to Have Taken the STEPS: Aspects that Contribute to Success in an Online Learning and Teaching Environment

Geoff Danaher, Central Queensland University, Australia
Violeta Todorovic, Central Queensland University, Australia

This chapter focuses on aspects that contribute to successful online learning in the Skills for Tertiary Education Preparatory Studies (STEPS) bridging program at CQUniversity in Australia. The program, which aims to instill the aptitudes, values and attitudes for effective university study in interrupted adult learners, has been running for 22 years and has had an online component for off campus students since 2006. Among the challenges involved in developing the online program have been promoting the value of critical reflection, recognizing the importance of learning as process to complement a focus on learning as product, and configuring an effective constructive alignment between factors shaping the learning and teaching process. The role of teachers’ reflective practices and students’ use of an online discussion forum in meeting these challenges is explored.

Chapter XXXVII
The Paradox of Equal Access

Kathleen V. Schmidt, DePaul University, USA

Distance education is defined as a system that can provide access to people who—because of work commitments, personal and/or social circumstances, geographical distance or poor quality or inadequate prior learning experiences—do not have the opportunity to study full time (Badat, 2004). It is seen as a way to correct inequalities, improving access to higher education for poorer or disadvantaged students. However, though distance education is seen as a feasible approach to achieve universal access for populations that might not otherwise receive a college education this chapter argues instead that universal access is just
Chapter XXXVIII
Understanding the Online Learner

Steven W. Schmidt, East Carolina University, USA

The expansion of distance education programs has allowed institutions of higher education to be successful in their collective mission to make educational programs more accessible to adults who normally would not have that access. Indeed, online learning has brought education to the people. Access to school is now as simple as logging on to the Internet in the privacy of one’s own home. Who are these students taking courses online? Why are they in online courses versus traditional classrooms? What is different about them, about their situations, and their expectations? Why are some online learners successful and others not? Why do some online learners continue to work through programs while others drop out? For online learning programs to be successful in the long term, it is important to have a thorough understanding of the online learner. This chapter examines the adult online learner in higher education.

Chapter XXXIX
Career and Technical Education in Light of the No Child Left Behind Legislation

Edward C. Fletcher Jr., The Ohio State University, USA
Chris Zirkle, The Ohio State University, USA

The No Child Left Behind Act of 2002 is considered to be the most comprehensive and highly scrutinized piece of educational legislation that has been enacted in history. With its focus on core academic content areas, the CTE community has desired to understand its impact on CTE programs. Based on a review of the recent literature on NCLB and CTE, this chapter examines the primary NCLB legislation provisions, presents the issues and challenges that have manifested as a result of the enactment of NCLB, investigates its impact on CTE, and assesses the coordination of NCLB and the new Carl D. Perkins Career and Technical Education Improvement Act of 2006. This chapter concludes with solutions and recommendations for further research.

Chapter XL
A Wiki on the Teaching of Business Administration

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Teresa Torres-Coronas, Universitat Rovira i Virgili, Spain
Araceli Rodriguez-Merayo, Universitat Rovira i Virgili, Spain
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Mario Arias-Oliva, Universitat Rovira i Virgili, Spain

The European Credit Transfer System establishes a calculation based on the work students do, rather than direct teaching hours as is the case with the current credit system. These are known as ECTS credits and they represent the amount of work the student needs to do to pass a subject. In short, ECTS credits are the quantity of work needed to learn a subject, including theory, practical classes, seminars, exams as well as anything the student has done individually which can be evaluated. This is where a wiki would provide a new space for students, where they could and should introduce information on matters related to the subject, as well as edit, correct, expand and improve, and so forth. the already existing information.
This information, which would be a collection of Web pages in hypertext, would make it possible to create a computer application based on the collaborative work of the students which can be accessed by any student from any Internet connection. At the same time, it can be assessed and therefore form part of the student’s final grade for the subject. The aim of this chapter is to show the methodology which will enable a wiki to be used for professional learning. Therefore, first we define what a Wiki is; second we discuss the Wiki as a collaborative teaching instrument; and third we deal with Wikis as a tool for educational assessment.

Section III
Research/Assessment, Adult/Higher Education, and Workplace Learning

Chapter XLI
Conducting Survey Research in Education .......................................................... 519
Ernest W. Brewer, University of Tennessee, USA

Survey research is prevalent among many professional fields. Both cost effective and time efficient, this method of research provides insight into the attitudes, thoughts, and opinions of populations. Because there are several types of survey research designs and data collection instruments, the researcher has the flexibility to determine which methods will work best for his or her particular study. Regardless of the method, the researcher must carefully select an excising instrument or construct the data collection instrument, as this is the key to a successful survey research study. This chapter discusses and defines survey research, provides the basic structure for conducting such research, describes the challenges surrounding survey research, provides recommendations when developing survey research studies, and presents information regarding future trends associated with survey research.

Chapter XLII
A Needs Assessment: Critical in Planning and Community Development ........................................ 534
Gail C. Farmer, California State University, USA
Theodora Papachristou, California State University, USA

The appropriate allocation of valuable human and financial resources requires a decision-making process based upon the most accurate information available. A community diagnostic assessment provides the framework to determine the important issues, propose potential solutions, and empower the community’s constituents. In this chapter, several theoretical models which can guide the assessment process are delineated along with six methods of needs assessment (key informant, public issues forum, service utilization, public records–social indicators, and field survey). For each method of assessment, its applicability, strengths and limitations are examined. The use of telecommunication technologies and internet resources are incorporated throughout the chapter.

Chapter XLIII
A Cross Sample Analysis: To Examine the Predictive Validity of an Instrument .............................. 550
Leping Liu, University of Nevada, Reno, USA
There are different methods to examine the predictive validity of an instrument. In this chapter, the author presents a method of validation—cross sample analysis, using a study as an example. This study demonstrates the procedures to determine whether a technology attitude instrument can predict student technology learning achievement consistently across four featured samples, with the data from two universities over a nine-year period. A base-model of prediction is first developed and then tested. The predictive validity of the instrument is confirmed by the model testing results that no significant differences exist between the means of the predicted and observed learning achievement scores in each sample group. Background knowledge and other relevant methods of validation are also reviewed in this chapter.

Chapter XLIV
Using Meta-Analysis as a Research Tool in Making Educational and Organizational Decisions...... 564

*Ernest W. Brewer, University of Tennessee, USA*

This chapter explores the viability of meta-analysis as a research tool for helping career and technical educational and organizational professionals make decisions. Following many of the same steps involved in the basic research process, meta-analysis provides a means for reconciling contradictory quantitative results from multiple studies, thereby generating a conclusive answer. However, meta-analysis is subject to many forms of bias and can pose practical problems. Meta-analysis has been used to study many issues in administration and management. From this chapter, educational and organizational professionals can determine if it is an appropriate tool to help them make decisions about specific challenges that they face.

Chapter XLV
Accreditation Experience of the Designated Subject Credential (DSC) Program at California State University, Long Beach .......................................................... 576

*Victor C. X. Wang, California State University, Long Beach, USA*

To receive accreditation from the National Council for Accreditation of Teacher Education (NCATE) and the California Commission on Teacher Credentialing (CCTC) is of utmost importance to every credential program in the State of California. Without it, programs are like drivers driving vehicles without a license. Naturally, those credential programs that do not receive accreditation are put on probation. Drawing from firsthand observation, reflection and introspection, the author of this article shares with the reader successful accreditation experience with the Designated Subjects Credential (DSC) program at California State University, Long Beach (CSULB) and reveals lessons associated with this accreditation experience.

Chapter XLVI

*Gregory C. Petty, University of Tennessee, USA*

Research in career and technical education stresses job skills, training, as well as knowledge of team work and positive work behavior. However, information regarding affective work performance is often
misunderstood or misrepresented, even by well meaning teachers. This chapter is a review of salient factors affecting worker attitudes and behaviors that can be used by CTE educators and researchers to improve their educational strategies. The Occupational Work Ethic Inventory (OWEI) has been used to collect work ethic data from business and industry workers and their supervisors from several occupational areas. These results have been investigated and their relative rating of work ethic factors are reported. CTE specialists and teachers should consider research methods that utilize 21st century statistics and techniques to assist students in working with groups and in developing work relevant curriculum. Additional research in affective workplace performance utilizing the OWEI could be useful in developing performance standards for performance improvement of workers.

Chapter XLVII
A Model of Modeling in Research and Practice: Technology Integration and Online Career Counseling

Leping Liu, University of Nevada, Reno, USA

Modeling is a tool that can be used in research and educational practices. In this chapter, modeling is defined as a systematic process in which scientific methods are used to identify and detect critical components in a field and the connections or relationship among them. This chapter focuses on the modeling procedures for research and practice in the field of using information technology in career and technical education. Six types of modeling are included: theory-based modeling, literature-based modeling, data-based modeling, case-based modeling, meta-analysis modeling, and propensity modeling. A model of the research modeling process is summarized at the end.

Chapter XLVIII
Curriculum Development for Adult Learners in Career and Technical Education

Victor C. X. Wang, California State University, Long Beach, USA

This chapter addresses pertinent issues concerning the development of meaningful curricula for adult learners in career and technical education. Although developing a curriculum or a course in adult vocational education depends on a competency-based model which has been borrowed from foreign countries, adult learning theory promotes a humanistic orientation for the development of self-actualizing persons. The chapter discusses how the two different models contribute to curriculum development in career and technical education.

Chapter XLIX
Methods and Methodology: A Study on Work-Based Learning Research Tools for Career Development

Elda Nikolou-Walker, Queen's University Belfast, Northern Ireland, UK

This study reviews the innovative programme developed in 2004 between the Work-Based Learning unit in the School of Education at Queen’s University, Belfast and the Police Service of Northern Ireland (PSNI). The scheme enables probationary officers to develop new skills by means of an Advanced Diploma in Work-Based Learning linked to the traditional training in operational policing. This new programme not only creates a new approach to police development, but also allows for the accredita-
tion of the Work-Based Learning. The focus of the entire learning experience is within the real world context. Its objective is to enable students to reflect on their own work-related experience, to develop their understanding of appropriate work-based research approaches and methods and to identify and design a work-based project. The aim is to explore the evidence of the positive experience of trainees who have embarked on this new method of learning. Using interviews, observations, focus-groups and questionnaires, a review has been conducted on how the programme is attempting to contribute towards a positive change regarding the abilities of the new police officers.

Chapter I
Learning to Work and Working to Learn: What We are Learning and How Technology and Assessment Can Help

Gary Brown, Washington State University, USA
Theron Desrosier, Washington State University, USA
Debbie Edwards, Washington State University, USA

The relationship between higher education and the world of work is complex and often characterized by a great deal of misperception, underscored by the recent press for accountability purportedly in response to reports of public dissatisfaction with the lack of transparency in institutions of higher education. This chapter explores the complex relationship between learning outcomes assessment, employer expectations, and traditional and emerging pedagogies. An approach used at Washington State University that uses assessment and technology as levers to help students and faculty bridge the real and the perceptual divide between learning in school and learning in the world of work is presented.

Chapter LI
The Dynamic of a Living Lecture in Career and Technical Education

John A. Henschke, University of Missouri, St Louis, USA

This chapter introduces the lecture as a long standard learning technique. The background is provided with the extensive value and scope, including the elements of good lectures. Weakness of the lecture centers around its being overused and/or misused. Strengths of the lecture include its familiarity, well accepted, and provides much information in a short period of time. A theoretical context is provided for maximizing the benefit of a lecture, which includes: guiding questions for use; a foundational learning theory; stressing engagement and interaction as integral; and, a large group theory to heighten engagement and interaction. Actually coupling listening teams (clarification, rebuttal, elaboration, application) with the lecture will make the lecture dynamic and vibrant. Fifteen additional groupings with varying purposes may be used to enhance the lecture with further engagement and interaction. Future trends will see stronger emphasis on including other supportive learning techniques in conjunction with the lecture to enhance its value and benefit.

Chapter LII
Serving Rural Communities Using Blended Technology

Jules K. Beck, University of Arkansas, Fayetteville, USA
Bobbie T. Biggs, University of Arkansas, Fayetteville, USA
This chapter presents a case study that illustrates how blended technology can provide an opportunity to complete an undergraduate degree through distance education for students living in rural communities. The research examines the educational, life, and work experiences of students who joined Cohort Ten in a Human Resource Development (HRD) curriculum. Some common perceptions related to their experience in the program emerged from qualitative interviews as students considered accessibility, achievement, and other issues important to achieving their goals. The blended technology approach used in the program included compressed interactive video (CIV); Blackboard, a Web-based classroom management system; and a face-to-face weekend gathering each semester of students and faculty from current cohorts.

**Chapter LIII**
Three Theoretical Perspectives on Informal Learning at Work .......................................................... 695

Mary F. Ziegler, University of Tennessee, USA

The workplace is a key arena for learning in today's society. The spiraling demand for knowledge in the workplace has increased interest in informal learning. In the field of adult education, informal learning has been recognized as one of the primary ways that adults learn throughout their lives. Although there are numerous informal learning approaches, the goal of this chapter is to explore three theoretical perspectives of informal learning in the workplace: individual, social, and integrated. These perspectives raise issues as well as highlight the limitations and benefits of informal workplace learning. The chapter concludes with solutions and recommendations for dealing with the issues and implications for the practice of adult education.

**Chapter LIV**
Developing an Integrated Evaluation Framework for E-Learning ....................................................... 707

Yonjoo Cho, Indiana University at Bloomington, USA
Sunyoung Park, University of Minnesota, USA
Sung Jun Jo, University of Minnesota, USA
Chang-Wook Jeung, University of Minnesota, USA
Doo Hun Lim, University of Oklahoma, USA

The purpose of this chapter is to provide an integrated evaluation framework of e-learning based on the basic concepts of evaluation and previous evaluation models. Several evaluation models were reviewed in order to lay the foundation for our proposed model of e-learning evaluation. Stufflebeam (1983), Kirkpatrick (1987), Phillips (1997), and Holton (1996) were chosen as four representative training evaluation models. The frameworks developed by Rosenberg (2001) and Khan (2005) were also reviewed to address several evaluation design issues for e-learning. Based on six evaluation models, an integrated framework is suggested for comprehensive e-learning evaluation. This integrated framework consists of six stages (i.e., context, resources, process, product, implementation, and outcomes) and two levels (i.e., program and organization). The practical case is introduced as an example that uses the integrated evaluation framework.

**Chapter LV**
Cognitive Development: The Learning Path of Community Development Practitioners ..................... 723

Jin Xiao, The Chinese University of Hong Kong, China
Adults continue to learn and revise their representation of knowledge scheme with a rational reflection on previous experience and interlink to action in the social setting. There is little knowledge about this cognitive process in China as collectivist conformity to a totalitarian state has been the mainstream culture. This chapter presents a case of cognitive development of a group of university graduates who started their first career in NGO. The stretching-on four stages of cognitive development is represented as: (a) Getting away from the authority reference; (b) Landing on opened-up horizons of reflection; (c) Building up interlinks across knowledge scheme and action; and (d) Linking cycles of experience with appropriation.

Chapter LVI
The Online Adult Learner: Profiles and Practices ................................................................. 737

Judith Parker, Teachers College/Columbia University, USA

While the online adult learners are growing in numbers, the diversity in what motivates them and what they expect from an online course has grown as well. This paper explores the current literature as well as qualitative and quantitative data from course surveys and student reflections in online courses taught by the author in an attempt to profile these learners, determine why they are taking online courses and investigate their evolving attitudes toward technology. It includes summaries and student quotes to portray the individual thoughts of online adult learners.

Chapter LVII
Who has the Ultimate Control? ............................................................................................. 747

Kerry Lee, University of Auckland, New Zealand

There are many different philosophies of technology and probably just as many interpretations as to what these philosophies actually mean. This chapter summarises the leading philosophies, and their proponents. It does not spend time on the semantics of each philosophy but rather provides an overall explanation and historical placing of each notion. Although this chapter focuses on adult education, it is also important to make links with the classroom. In doing so it provides the valid justification for inclusion and application of the theory it contains. This will enable teachers to reflect on their own philosophy of technological innovations. In doing so it is hoped, they will gain the confidence and ability to expose their children to these ideas. Children need to understand that technology has a key role in our society, and as members of society we have an important role in managing the development and use of technology. By studying the philosophy of technology, children will recognize the interaction between technology and society and enable them to be fully technologically literate citizens.

Chapter LVIII
The Theory and Practice of Teaching in Today’s Colleges and Universities ....................... 764

Victor C. X. Wang, California State University, Long Beach, USA

Teaching is changing and it is being forced to change by many forces of social change. Today’s theory and practice of teaching in adult and higher education are not only shaped by technology, but also by prevalent teaching and learning theories such as constructivism, progressive principles of education, humanism and even behaviorism. While behaviorism, a major component of pedagogical teaching, suc-
cessfully dominated adult and higher education in the past, the purpose of this chapter is to demonstrate that we are experiencing a paradigm shift from being pedagogical in our instruction to an andragogical mode of education in the 21st century due to the fact that we do know, to some extent, how students learn. Therefore, the way knowledge is delivered in the new century must be changed in order to serve the needs of this learning society.

Chapter LIX
Web 2.0 Technologies: Social Software Applied to Higher Education and Adult Learning .......... 779
Teresa Torres-Coronas, Universitat Rovira i Virgili, Spain
Ricard Monclus-Guitart, Universitat Rovira i Virgili, Spain
Araceli Rodriguez-Merayo, Universitat Rovira i Virgili, Spain
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Web 2.0 technologies are playing an important role in building social capital through increasing flows of information, and building on knowledge and human capacity of learning. The purpose of this chapter is to show the role that social software, a component of Web 2.0 technologies, can play in higher education and adult learning. This proposal focuses on the role of Web 2.0 technologies in promoting learning. New learning paradigms and pedagogical applications are also discussed.

Chapter LX
Evolution of Adult Education: Is our Future in E-Learning? .......................................................... 791
Vivian W. Mott, East Carolina University, USA

This chapter explores first the evolution of adult learning primarily in a Western context and particularly in terms of career and technical education. The discussion includes not only lifelong and self-directed learning, but also the various contexts and venues in which career and technical education occurs. The chapter concludes with both the challenge and promise of e-learning in the field of adult and continuing education, asking what the impact of e-learning specifically may be for learners, stake-holders, instructors, and the field itself.

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Foreword

When I was first approached to write a foreword for the *Handbook of Research on E-Learning: Applications for Career and Technical Education*, I replied that, although I have taught online for several years, I was actually a scholar of adult education, not career and technical education, and I questioned my ability to introduce this handbook. However, when I began reading the chapters in this volume, I quickly came to realize that career and technical education is a part of adult education, and I began to feel more comfortable. I then thought about the research and writing I have done in relation to the more than 25 years I worked with tradespeople to help them become teachers of their trades, and I considered my early roots in adult education, which involved designing instruction in a practical and concrete fashion. My early work on planning instruction has informed people in fields such as military education, forestry, agriculture, health professions training, and, of course, the trades. This thinking brought me to a place where I could see my connection with career and technical education.

Adult education has a history of social reform, and today, critical theory remains a cornerstone of our field. If we look back, however, to those historical roots, we can quickly see how they relate to career and technical education. In Canada, in the 1920s, the Antigonish Movement was founded as a way to help ordinary people foster economic development through cooperatives and credit unions. Through kitchen meetings, study groups, and community-based courses, fishers, farmers, and workers worked toward economic independence, social reform, and democracy. Similarly, in the United States, in the 1930s, the Highland Folk School was founded to provide education for ordinary people as a way of effecting social change. Literacy skills, critical thinking, developing voice and confidence, and practical problem solving were fostered.

Career and technical education is education for work. It not only prepares people for work, but it also promotes opportunities for individuals to be more competitive in the labor force and encourages economic development by improving performance of workers and addressing the social significance of work. I am reminded of the work currently being done by adult educators on social sustainability in Australia. Social sustainability is described as a positive condition created by social institutions and policies including: equity of access to key services (health, education, and so forth), equity between generations (future generations will not be disadvantaged by current activities), a valuing and integration of disparate cultures, and participation of citizens in political activity. The interrelated nature of adult education and career and technical education is clear. Then, with the expansion of the use of technology in education in general, career and technical education has become increasingly reliant on e-learning. At the same time, practitioners and writers in the field maintain a focus on learners as adults and what we know about how adults learn.
In linking career and technical education with adult education and technology, this handbook ad­
dresses many diverse issues that touch on the intersection of the fields. For example, barriers to access to
distance learning are discussed, both in terms of equipment, cost, resources, and technical support and in
terms of learners’ feelings of isolation, need for feedback, and need for support. Maintaining culturally
sensitive practices in e-learning becomes increasingly important when people are seeking and receiving
training across cultures. Issues of how power is viewed in different cultures, individualistic and collection
perspectives, gender roles, and language become central to facilitating learning in a global environment.
Fostering communities of practice is another key issue for career and technical education offered in an
online environment. Communities of practice allow learners to gain multiple perspectives and collaborate
with others in their learning. In addition, how educators move from physical spaces to e-learning spaces
needs to be carefully considered; we cannot simply “transfer material” from one place to another, but
rather we need to work out how the different form that space takes can be utilized fully.

These are just a few of the many facets of career and technical education discussed in this handbook.
The comprehensive coverage of important issues and trends in the field goes a long way toward filling
a significant gap in the literature. Practitioners, scholars, researchers, and administrators will all benefit
from this volume. I know that I learned a lot from having the opportunity to prepare this foreword. I
congratulate the editor and authors for bringing this material together for all of us.

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Patricia Cranton’s primary research interests are in the areas of teaching and learning in higher education, transformative
learning, and most recently, authenticity and individuation. She is currently a visiting professor of adult education at Penn State
University in Harrisburg, Pennsylvania. Patricia Cranton’s most recent books include a second edition of Planning Instruction
for Adult Learners (2000), Becoming an Authentic Teacher (2001), Finding our Way: A Guide for Adult Educators (2003), and
Career and technical education (CTE) is for all practical purposes education for work, impacting education in agriculture, business, health occupations, family and consumer sciences, technology and vocational guidance. As noted by Wenrich, Wenrich, and Galloway (1988, p. 16), primitive people did not need much formal education in order to work. They learned to work by associating with experienced workers as apprentices (Wang, 2008). For example, as Egyptians developed hieroglyphics (a form of picture writing) and papyrus (paper), they also developed apprenticeships where the students learned to write on-the-job with an experienced scribe (Wang, 2008, p. 5). Indeed, the history of CTE parallels the efforts of humanity from the Stone Age to modern civilization. The more civilized humans become, the more formal education we need.

With the shift from an agrarian society to an industrialized society, workers needed more formal education and training in order to be efficient. As the more highly developed nations have transitioned from the industrial revolution to an age of technology and information, the less developed world has just begun the industrial revolution. Formal education and training for workers have become all the more important everywhere. Writing in 2006, Wang (p. 39) argues, “Without exaggeration, as humans developed, so did the hard work of humanity from the Stone Age to modern civilization. Human beings cannot make any progress without hard, intelligent work.”

One of CTE’s important objectives is to meet the manpower needs of society. We need engineers, doctors, lawyers, and professors; we also need plumbers, carpenters, masons and technicians and technologists. Agriculture education, the foundation for CTE, began with the “common school movement” when former president Andrew Jackson articulated an equalitarian doctrine of all knowledge and ability, in which the attainments of a farmer or merchant were on the same level as the accomplishments of a classical educated scholar.

Why education for work? This is the most common question that most people ask. According to Marx (1890/1929), work produces surplus value and this surplus value is termed as “added value” in CTE. Without added value or surplus value, work would lead to meaningless activism, a waste of one’s physical and mental efforts directed towards some end or purpose. From this rationale, we can address the positive relationship between CTE and work.

CTE is defined as any organized educational programs that are directly related to the preparation of individuals for paid or unpaid employment or for additional preparation for a career requiring less than a baccalaureate degree. This definition is no longer accurate as it contains a mistaken perception. In fact, this definition only applies to one group of learners in CTE who are not college bound. We also have a large number of CTE learners preparing for careers requiring a baccalaureate or higher level degree.
In fact, more than 200 universities in the United States alone offer advanced degrees in CTE, and so do many other universities across the globe! As countries such as China and India became more industrialized, more and more programs in CTE are being offered by their educational institutions. CTE has thus become a vibrant sector in the education field.

Gray and Herr (1998, p.4) note that CTE serves to:

(1) **promote individual opportunity by making students more competitive in the labor force**, and (2) **make a nation economically strong and firms internationally competitive by solving human performance problems of incumbent workers**.

CTE will play an even more important role in the education and training of today’s workers. CTE cannot be separated from one’s occupations. Dewey (1963, 1966) was right in stating that occupations should be used as vehicles of instruction in CTE. He opposed CTE which was limited only to the acquisition of job skills; the underlying principles of the work processes and social significance of work must be included. He further believed that through vocational studies, culture might be made truly vital for many students (as cited in Wang, 2008, p. 14). From Dewey’s rationale, we can conclude that CTE has a broader mission in the field of preparing people for the world of work.

The past two decades have witnessed the growth and expansion of the use of the World Wide Web (WWW) in CTE teaching and learning in this information society. As the majority of the universities in North America began to use WebCT or Blackboard programs to deliver their educational programs to students, especially working adults, educators and practitioners in the field of CTE have adopted these instructional tools. E-learning has become the buzz term in CTE. Technology is now at the core of schools’ CTE offerings. Technology education prepares students for our technological world. Technology education is returning to the system that Dewey supported years ago when he stated that we should use the occupations as the vehicle of instruction (King & Wang, 2008, p. 86).

In the information society, E-learning is not a matter of whether some senior faculty like teaching with the use of technology. It has become a matter of how faculty will be able to teach with the use of information technologies effectively by integrating not just behaviorist teaching philosophies, but also principles of adult learning. Malcolm Knowles, the father of adult education, correctly predicted in the 1970s that education in the 21st Century would be delivered electronically (1975, as cited in Wang, 2005, p. 35).

Although adult education as an academic field has become a separate entity, we cannot address CTE without taking into consideration adult education first. When we think about our students/learners in the field of CTE, they are mostly persons over the age of sixteen. Most have completed or left high school; they may have already entered the labor market or be unemployed. CTE educators are preparing adult learners enter the world of work or reenter the world of work. Our mission has thus become two-fold: we prepare traditional age students as well as adult learners to enter the technological society for paid or unpaid employment.

The name of CTE reflects the culture and societal developments of our society. Because we live in this technological society, technology education has become a core subject for traditional age students as well as adult students. CTE first emerged as “manual training” as the nature of CTE determined its name. Then, “manual arts” was used to instead of “manual training” as a means of placing emphasis on artistic elements of manual activity (Ham, 1990). Later, “industrial arts” was used to replace “manual
arts.” With the passage of the Smith-Hughes Act of 1917 (Douglas, 1921), trade and industrial vocational education emerged as a major educational program in the field of CTE. All this illustrates that fact that CTE has come a long way. It has survived and will continue to thrive in order to meet the manpower needs of any society.


Roberts’ (1965) definitive text titled *Vocational and Practical Arts Education* (2nd ed.) has become outmoded. Now we need a handbook linking CTE with adult education and technology. When I began to call for chapters for this Handbook, I stated, “As vocational education has adopted its new name, Career and Technical Education (CTE), it has become one of the most rapidly changing disciplines. No longer is CTE below the baccalaureate level. As adult students, older adults and even retired military personnel enter CTE, it has become closely related to adult education and tertiary education. As the field of CTE continues to evolve, e-learning has contributed to both CTE and adult education. In such an ever-evolving environment, teachers, researchers and professionals of the discipline need access to the most current information about the concepts, issues, trends and technologies in this changing field.”

With increasing confidence, we can claim that such a handbook has filled a much need void in the field and in the literature. With such a handbook, we are able to provide comprehensive coverage and definitions of the most important issues, concepts, trends and technologies in CTE. More importantly, this new publication will be distributed worldwide among academic and professional institutions and will be instrumental in providing researchers, scholars, students and adult learning professionals with access to the latest knowledge related to CTE.

As my proposal to publish such a handbook was approved by IGI Global, I began to collect chapter proposals. All proposals were carefully reviewed by the editor in light of their suitability, the researcher’s records of similar work in the area of the proposed topics, and the best proposal for topics with multiple proposals. The goal was to assemble the best minds in CTE, Adult Education and Technology fields from all over the world to contribute entries to the handbook. Upon the receipt of full entry submissions, each submission was forwarded to expert external reviewers on a double-blind, peer review basis. Only submissions with strong and favorable reviews were chosen as entries for this handbook. In many cases, submissions were sent back for several revisions prior to final acceptance. As a result, this handbook includes more than 50 entries highlighting current concepts, issues and emerging technologies in the field. All entries are written by knowledgeable, distinguished scholars from many prominent research institutions around the world.

These leading experts come from New Zealand, Australia, China, Kenya, Italy, Spain, United Kingdom, and the United States. Many of them are professors, program directors, department chairs and journal editors. Their cutting edge research will serve the field for many years to come. As readers flip through the pages of this handbook, they will learn not only perspectives regarding CTE from North America, but also they will be familiarized with perspectives in CTE from other continents and countries. It is these leading experts who have made such a handbook possible in the field.

The diverse and comprehensive coverage of CTE, adult education and use of technology in this authoritative handbook will contribute to a better understanding all topics, research, and discoveries in
this evolving, significant field of study. Furthermore, the contributions included in this handbook will be instrumental in the expansion of the body of knowledge in this broad field. The coverage of this handbook provides a reference resource for both CTE researchers and also aids decision makers in obtaining a greater understanding of the concepts, issues, problems, trends, challenges and opportunities related to this field of study. It is my sincere hope that this publication and its great amount of information and research will assist my fellow researchers/scholars, faculty, their students, and our organizational decision makers in enhancing their understanding of this discipline. Perhaps this publication will even inspire its readers to contribute to the current discoveries in this immense field, tapping possibilities to assist humankind in making more surplus or added value in CTE and in their work in general.

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November 2, 2008

REFERENCES


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Second, I wish to express my heartfelt thanks to our reviewers. Some reviewers have even contributed chapters to this handbook. All of our reviewers for this handbook are high profile scholars in the field. Their constructive, critical and comprehensive reviews have definitely helped with the quality of this book. No need to say that their reviews set the benchmark. Although their names and affiliation have appeared on the front page of the handbook, I wish to give them another round of applause here again before our readers for their accurate and precise review work. Not only can you find their scholarly work from this handbook, but also you can find their scholarly work elsewhere.

Special thanks also go to the publishing team at IGI Global, whose contributions throughout the whole process from inception of the initial idea to final publication have been invaluable. In particular to Heather Probst, Christine Bufton, who continuously prodded via e-mail for keeping the project on schedule and to Jan Travers and Kristin Klinger who accepted my proposal to publish this groundbreaking handbook in CTE, adult education and technology. I hope Kristin Klinger and Jan Travers will publish the second edition of this handbook six or ten years from its first publication.

Special thanks go to Dr. Barbara Hinton, Professor of CTE and adult education/Associate Dean/my dissertation director at the University of Arkansas, Dr. Janice Frates, Professor/my mentor at California State University, Long Beach (CSULB), Dr. Lesley Farmer, Professor/Author of 25 books/my coauthor at CSULB, who have helped review more than eight chapters for the handbook. I would also like to thank Dr. Patricia Cranton who wrote a foreword for this handbook. We all know that Dr. Cranton has been an experts’ expert in the field of CTE, adult education and technology. Dr. Cranton’s journal articles and books are widely cited throughout the world and virtually every university library in North America keeps her book(s) and her scholarly work can be found from many other countries. And last but not least, my family, Katie Wang, Anni Wang and Anthony Wang, for their unfailing support and encouragement during the many months it took to give birth to this book.
In summary, I wish to thank all of the people for their insights and excellent contributions to this handbook. I thank all of our readers who have become consumers of this excellent handbook. This book will assist you in your educational and scholarly endeavors.

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November 2, 2008
As career and technical education continues to evolve, technology applications are rapidly becoming vital instruments for instructional training and valuable learning tools for the overall enhancement of student experience.

The Handbook of Research on E-Learning Applications for Career and Technical Education: Technologies for Vocational Training provides an authoritative reference collection on leading international insights into the integration of technology tools and applications with adult and vocational instruction. This Handbook of Research offers academicians, practitioners, and researchers a comprehensive look at various levels of career and technical programs that are quickly advancing with technology.

**Topics Covered:**
- Adult education
- Automated learning
- Career and technical education
- Discussion boards
- Culturally-sensitive e-learning practices
- Distance education
- E-learning
- Fostering online communities
- Reflective teaching
- Supervising projects and dissertations
- Technical education