Career Education and Information Technology Diffusion/Integration

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Abstract: There has been such a burgeoning need of training for graduating high school seniors, at-risk high school dropouts, and adults seeking new careers, that it would be difficult to pinpoint which group or events may have precipitated this unprecedented demand for career education. Perhaps it was the rapid expanse of the Internet, bringing world events and economies to viewer's fingertips; or it may have been the uncertainties of national economies and corporations prompting many to seek alternative careers; it may have even been the increasing numbers of high school seniors that needed education for jobs upon graduation that prompted new opportunities for learning. But, regardless of the circumstances, new forms of teaching and learning have emerged, and new categories of occupations have appeared that offer opportunities to those willing to study to acquire the education needed for these new career paths in the world of work. There is a growing body of research on career education, vocational training, and corporate universities and, while research in the field of career education has often included corporate and government-sponsored research, it now includes research strands on community colleges, for-profit universities and technology training institutions. In addition, important research on andragogy and on how adults learn have now become important strands of research on adult and career education. Career resources, the use of technology in instruction, and international workforce influences are also discussed in this review of career education, with a discussion of how the shift from knowledge acquisition in the "Information Age" to holistic knowledge integration in the "Cognitive Age" has transformed the way adults learn and work in the 21st century.

Introduction

The term "career education" in the 1960s was often utilized in reference to trade courses, or unaccredited training that a person could pay for to learn a skill and earn a certificate of proficiency. The term "vocational training" was also utilized interchangeably with trade schools, often with a "blue collar" connotation, for schools that taught skills, such as plumbing and auto maintenance. (The connotation was not intended to be negative, yet it definitely conveyed the meaning of career-track training). At that time there were few, if any, terms that conveyed wide-ranging and accredited education that would prepare an individual for a worthy *career.* Through the 1980s career education remained in the purview of high school "shop classes", industrial trade schools, emerging computer training schools and community colleges. As home computers became more popular, some interesting shifts began to occur and all of these career schools began to enjoy increased enrollments, particularly if they offered computer training and certification classes.

Over the last twenty years, from the 1980s onward, and particularly since the advent of the Internet and distance education, the terms "vocational schools" and "trade schools" have evolved and transformed into career education, certification and Associate Degree programs at community colleges and for-profit universities. The term "career education" now encompasses a much broader spectrum that encompass not only the "trade" schools, and corporate and on-line colleges, four year accredited universities, and life-long training programs. And career education has also expanded to covers a number of specialized and diverse career fields and technologies, not just computer programming, but specialized medical training, international communications, and even subjects, such as graphics and culinary arts.

Analysis of career trends and options in the United States from both the public and private sectors all point to career education becoming even more important in the 21st century where learning will be lifelong (Bureau of Labor Statistics, 2005; Department of Commerce, 2005; United Stated Department of Labor, 2005; United States International Trade Commission, 2005). So it will be more important than ever to provide both alternative vocational and higher educational opportunities for a burgeoning adult population. "Lifelong learning is the key to education in the 21st century" (Drucker, 1992, 351).

Career education has provided benchmarks in the fields of business and technology, and, no doubt, will

continue to have a place in the careers of future populations of learners in the world of work. The field of career education is so broad, it difficult to go into detail about any one area of this topic, but since this section is about career education, the topic of career education should be addressed in the context of both education and content knowledge. In addition, career education trends will be reviewed and areas where technology has emerged as a vehicle for effective transmission of career education will be discussed.

Education in Career Preparation

As more corporations come to understand the need for educational knowledge to be merged with content knowledge, the blending of training with education will become more essential to corporate universities and training environments. And, as technology bursts into everyone's lives and hurls information at them through the Internet and I-pods®, more than ever this blending, not only of training, but of every day living, will help stir these students and educational elements into a global electronic stew.

In the study of how adults learn, some key factors necessary for most adults to learn are the need to be self-directed, to learn experientially, and to have problem-solving orientation (Knowles, 1980). Adult learners need to know information, like, what are the implications? What are the goals and objectives? And, what are the assessments? They need to have ways to make sense of the new data, methods that will help them integrate the new data with what they already know. Standards, checklists, quality measures, all make sense to adult learners. So, career education must include all of these elements. Best practice models for career education usually include inquiry, reflection and sharing of collective expertise to support learning and foster meaningful thinking. Exemplars in career education will generally include apprenticeships, facilitator-mentoring that supports knowledge acquisition, and, optimally, clear measures of what constitutes improved career performance in each learning situation (Prager, 1994).

Andragogy

Andragogy is a term that would not have been used much in career education twenty-five years ago. At that time another term, pedagogy, was used to represent the science of education. While the term pedagogy has generally been used as the definition for the study of teaching, the word pedagogy was not, in truth, entirely appropriate, since *peda* is actually the Greek prefix for child, not adult. Through the first half of the 20th Century, the same techniques that were used to teach children were also applied to adults. However, adults did not learn in the exact same way as children, and in fact, had some very different approaches to learning. "To compensate for this misinterpretation, the word andragogy was created to refer specifically to the art and science of teaching adults" (Lingualliinks Library®, 1997). Andragogy is the study of how adults learn, but it is also the study of observations of adults' actions that facilitate their learning. "Adults are self-directed and expect to take responsibility for decisions" (Linguallinks® Library, 1997). There are a number of guidelines and strategies that can be used to involve adults in learning more effectively that would not work as effectively for children, such as the use of strategies that would help adults improve their performance in social contexts outside of their learning sphere, or the use of strategies that would reinforce expectations that the adult learner's class time is spent in meaningful activities.

A pioneer in the field of adult learning, Malcolm Knowles compiled a list of characteristics that represented the key facets of andragogy (Knowles, 1980). He posed that andragogy was based on four crucial assumptions about the adult learners that differed from the assumptions about child learners:

- Adults are social beings who are products of history and culture
- Andragogy facilitates the development of critical awareness
- Adults are encouraged to think critically and not accept other's interpretations or meanings
- There are essential features to the andragogic process. Some of these features are: a nonprescriptive attitude; a issue-centered curricula; learning must present problems to be solved; must achieve some kind of established pattern or practice; must include negotiation; must include shared responsibility for learning; must have some kind of valuing process; must have ongoing dialogue; and, it must demonstrate equality through openness, mutual respect, integrated thinking and learning. (Nebraska Institute for the Study of Adult Literacy, 2005)

It is clear that these components, when included in the design of career education, can have meaningful results for adult learners in the acquisition and, optimally, in the retention and assimilation of this new knowledge.

Evaluation of Learning

Evaluation is another important component of the andragogical process that is crucial to effective career education. Evaluation is often documented and reported through four key types of evaluation: documentation of change in style and content of verbal classroom exchanges; observations of power and responsibility sharing; individual reflection; and group reflection on the changing nature of the group progress (Nebraska Institute for the Study of Adult Literacy, 2005).

Research on adult learning has uncovered some interesting side benefits to adult education that incorporates the principles of andragogy into the design of career education. It appears that adult career instruction, when combined with other crucial adult education, such as literacy instruction, can help students to make more enduring progress than if these instructions were taught to adult learners alone, either as literacy or training instruction (Nebraska Institute for the Study of Adult Literacy, 2005). Links between literacy and occupational education have been established through research studies, such as the United States Department of Labor *Jobs Program* study, where the study focus was placed on education that led to employment. Even in some occupational training programs there that required a certain grade level criteria required for enrollment, the majority of students were willing to undergo screening to quality to take courses that combined job training with other educational elements, such as literacy instruction. "Contextualized curriculum development allows literacy, language, and general education degree (GED) programs to incorporate texts and tasks from the occupational curriculum into their classrooms and allows individuals to prepare for challenges they might face in the training program - even if they would still score below a cut point on a test" (2005). The research conducted in these contextualized work-oriented and literacy education classes indicates there could be aspects of combined instruction that aggregate richer aspects of literacy education with career training education. "Efforts to contextualize work-oriented classes or programs…expand upon the best aspects of current practice in both literacy education and vocational education" (2005).

The use of measures to assess the progress of adult learners in career education are often utilitarian, being more geared to assess whether the adult learner has been sufficiently trained in mastering the job skills needed to work in that respective career field. Measurement tools are often product-based, and can consist of both individual and group project assessments. If the assessments are designed to include the four key andragogical components, there will be measurement of improvements in communications, of how the students share and delegate responsibilities in group projects, and of both individual and group reflections (Knowles, 1980; Nebraska Institute for the Study of Adult Literacy, 2005).

Literature on Career Education

Since the field of career education has expanded to contain so many diverse types of education and career fields, it would be difficult to explore the seminal research for the varied strands of academic, vocational, industrial, technical, and advanced career research conducted across these disciplines. Yet, there have been such rapid advancements in each field, so the mention of some of the research studies conducted in each field is warranted and is provided herein, with references to research in each respective field over the last twenty-five years. In addition, reference terms for career education that have emerged, such as, the "world of work" and "career counseling", are also discussed, since these terms cross over into a variety of disciplines and add to the mix of interdisciplinary research across these diverse areas.

Academic Career Education

Academic career research has been parceled largely into academic and administrative tracks, with subdivisions of academic tracks into respective academic disciplines, which are monitored through, benchmark professional associations and accrediting agencies. Administrative subdivisions also have subdivisions into community college, technical and vocational, and higher educational administrative subdivisions (Baronne, 2005; Kowaltski & Reitzug, 1993; Peterson, Davis, 1977; Southern Illinois University, 1980; United States Department of Education, National Center for Education Statistics, 1998; United States Distance Learning Association, 2001). In addition, there are yet further subdivisions into higher education administration, kindergarten – twelfth grade education administration, special education administration, government military education, with niche areas, such as information technology administration, finance administration, project management, among others.

Vocational Education

While the United States Office of Vocational and Adult Education still uses the term "vocation" to align with the 1998 Carl D. Perkins Vocational and Technical Education Act and of the ongoing studies of outcomes of vocational education in the United States, the term "vocational education" is currently not in use as much as other terms, such as industrial or technical education, and is often replaced or used interchangeably with these terms. According to the dictionary definition of vocational education, it is the "training for a specific vocation in industry or agriculture or trade" (Dictionary.Com®, 2005). The United States Office of Vocational and Adult Education places emphasis on post-secondary education, career and technical education, adult education and literacy, and community college education (Silverberg, Warner, Fong, Goodwin, 2004; United States Office of Vocational and Adult Education, 2005a, b). (A discussion of available resources can be found in the career resources section).

Industrial Career Education

Industrial career education has also been called industrial arts and includes the classic "shop" classes of woodworking, automobile repair, equipment repair, and masonry, but now can include training in safety maintenance, security protection, and diverse computer application certifications. In addition, it can also include professional training for plumbing and electrical careers and may include career training in electronics, application certifications, software coding, and project management (Duenk, 1990; ITT Technical Institute Learning Corporation, 2005; Job Training Systems, Inc., 2005; National Academics Products and Instruments, 2005). Industrial education has been folded into vocational and technical education over the last twenty years and was in decline until it reemerged to command popularity with students searching for career education on the Internet and it is likely that this trend will continue. Research studies indicate that many of the institutions offering industrial education are enjoying substantial increases in online enrollments through a growing variety of industrial career offerings (Johnson, Benson, Duncan, et al, 2003; National Center for Education Statistics, 1999a; 1999b; 2000).

Technical Education

The term "technical education" often overlaps industrial education and can have some of the same types of course offerings as industrial career education, but in addition to electronics, computer hardware and software education, technical education can also include certain types of engineering and medical applications, environmental design, aviation training applications, and other work training classifications, such as culinary arts, theater set design, and emerging technologies. The term technical education came into use with the rise of interest in technology in the early 1980s (Davis, 2001; GannonCook, 2005). At that time the terms vocational and "trade school" education were used interchangeably, but as the emerging field of personal computing continued to gain importance in the career arena, a term that was more appropriate and inclusive of technology was needed. The term "technical education" came into informal conversational use to fill that need, then was adopted into curricula as students increased their requests for information on technical education. As the shift from industrial age careers moved into and through the information age, and now into the age of cognition, technology education has sustained consistent growth and promises career paths to millions of adult and non-degree seekers who are on a quest to learn new career skills. Again, the Internet, with its 24 hour availability of data, now presents opportunities for technical training to those persons who previously would not have been able to pursue new career training in traditional classroom settings.

Advanced Careers

Increasingly, as new career fields are created from the demands of society, there is a need for training for advanced careers in these fields. Often universities seek to fill those needs, but may not always operate within administrative environments where they can expeditiously respond to those needs. Hence, the creation of advanced training programs by educational institutions other than those customarily responsible for those offerings. For example, today there are two year colleges that also offer advanced courses that can only be taken after completion of four degrees, such as physician assistant programs at Red Rocks Community College in Denver, Colorado. But there are also two year associate degree programs in physician assistant studies at other community colleges that may or may not offer similar courses, along with numerous graduate-level physician assistant programs throughout the United States, as well as internationally. Many of these advanced training programs are conducted at accredited institutions, and many of these institutions also offer their advanced training programs on the Internet. So, not only

can interested students pursue these highly specialized and advanced programs, but they can often do so online. It is no longer unusual for a specialized online degree program to contain students from many countries, nor is it unusual for a number of students to be pursuing a new specialization career online (DePaul University School for New Learning, 2005). What is unusual is for those students to be pursuing these advanced training programs from institutions that may not have previously been viewed as education destinations in prior years, but, because of the innovative programs being offered by these institutions and the speed with which the programs can be implemented, these programs can often offer students advanced training more expeditiously than more traditional academic programs. The challenge will become greater, therefore, for higher educational institutions to be able to respond to these growing demands and create quality programs, if the institutions deem the programs are warranted, and to address these needs for students expeditiously without sacrificing quality (Baldridge, 1999; Berreby, 1999; Johnson, Benson, Duncan, Shinkareva, Taylor, Treat, 2003; Surry & Gustafson, 1999; VandenBesselaar & Mom, 1996; Wilkinson, 1999).

World of Work

Another term used quite often in career education is the "world of work." This term has become widely used to connote career education and, while the term's origins are unknown, attribution has been linked to *University of Phoenix®, McDonald's® Corporate University*, even *Donald Trump's Corporate University®*. The term is also used increasingly in adult education programs and university programs that feature competency-based curricula. Some examples would include schools, such as *Capella University, DePaul University School for New Learning,* and a growing number of community and for-profit colleges. It seems to make sense to the students to use the knowledge acquired in their work careers and apply that knowledge towards competencies that can be exchanged for college or competency credit that can, in turn, be applied towards a degree or certificate. A few of the institutions offering competency-based programs geared for the world of work also offer liberal arts degrees, such as DePaul University's School for New Learning. The reasoning for enveloping competency-based learning in a liberal arts degree program is so that students not only earn competency credit towards a degree, but also earn a liberal arts degree that produces a "well-rounded graduate" that can write competently, reason soundly, and function capably in an international workplace. Since these types of competency-based programs are enjoying great success and there are growing numbers of community colleges, for-profit colleges, and universities gearing up to offer these kinds of programs, the likelihood of matching career education with competencies in the world of work will continue (Scerba, 2005).

Professional Development and Career Education

There are many conjectures and debates as to how many careers the average person will have in a working career of forty-fifty years, but the average is a minimum of three to seven careers for most United States citizens between the ages of 18 - 65 (United States Department of Labor, 2005). Since it appears that many citizens will work for almost fifty years and have several careers through those years, they will also need to have some kind of preparation and training from one career into another. In addition, there are going to continuously be new high school graduates (or dropouts) entering the work force, or going on to complete their education via higher education, career education programs, or, in the case of high school dropouts, GED and literacy programs, so it is imperative that ongoing, lifelong learning programs increasingly be made available to the general populace. Diffusion of information to facilitate career development can be done in a number of methods, such as delivery via scheduled training sessions in community centers and colleges, in nonprofit agency centers, in universities, and for-profit corporations (Robinson, 1996, 1995). Diffusion can also be readily done via Internet dissemination, through nonprofit and corporate sites, through open-source host sites and through for-profit corporate training centers. With the availability of professional development programs increasingly being administered online, it becomes ever more important that these programs be created and administered so that learners not only acquire the information from the training, but absorb and integrate the materials effectively. Organizations that provide standards for the monitoring of instructional design and implementation of online programs can provide benchmarks to be adopted by institutions and organizations utilizing online educational programs. Examples of such organizations would include International Board of Standards for Training, Performance and Instruction (IBSTPI); American Standards for Training and Development (ASTD); American Educational Communications and Technology Standards (AECT); Standards for Online Learning, Teacher Centers, NY Inst of Technology (SOLTC); National Center of the Accreditation for Teacher Education (NCATE); and International Society of Performance Improvement (ISPI).

Career Counseling

Career counseling has become more challenging as innovative careers in technology and the sciences are introduced daily. It is often difficult to keep pace with the incoming data of all of the new careers available to both students embarking on their first careers and to adult learners who may be looking at changing or retraining their careers. Certain models have been established through the years that facilitate career counseling. Seminal studies that may have origins in the workplace, in psychology, human services, or education, of Maslow, Gagne, Vroom, Erikson, Rogers, Bloom and Bruner, have been established as models of counseling that are still used in employment counseling and contemporary human resources (Bandura, 1982; Gagne, & Merrill, 1990 Maslow, 1954, 1970; Rogers & Rogers, 1976; Rogers, 1983, 1995; Rogers & Shoemaker, 1971; Rogers, Talbot, & Cosgrove, 1984; Vroom & Vroom, 1964; Zunker, in press). These models include behavioral, existential, constructivist, pragmatist and postmodern models. While the earlier career counseling models tended to be more observational and prescriptive, recent models have focused on interactivity, collaboration, and the construction of shared outcomes. So counselors not only have a responsibility to provide contemporary career advising that includes recommendations to be current with technology, but also to help advisees understand their need to be prepared for constant change and global competition. In a world connected by technology, the need to address how to cope with physical isolation and the need for a decent quality of life will continue as key challenges facing 21st century career counselors.

Lifelong Learning

Lifelong learning is a term that was coined almost fifty years ago by human relations expert Robert Dubin (Dubin, 1958), yet has only come into vogue within the last fifteen years, due in part to the success of the Internet. Dubin initially coined the term "world of work" in conjunction with his work with corporations and he later developed the concept of the "industrial society" that led him to write about the relationships between humans and their work environments. The "world of work" has since been adopted and utilized in the context of career education and has become a term that aptly represents the need for career professionals, skilled laborers, and general workers to continue learning new skills and acquire new knowledge and training for the retention of current jobs or acquisition of new career paths. Due largely to the availability of a plethora of Internet resources and online databases available on a wide variety of career topics, and recently there has been almost as much made available to lifelong learners (*Eyewitness to History®*, 2005; *World of Work Magazine®, 2005)*. Questions, such as "what about life after and beyond school?" (Young, 2005, p. 88). And, "How can students prepare for their futures?" (p.88) are crucial questions in a world where technology can change so quickly it is almost obsolete as soon as it is available commercially. While the need to retain or advance in one's career might be the initial motivator, ultimately the quest for updated skill sets could extend to new arenas of curiosity and exploration for new knowledge. If lifelong pursuit of knowledge is encouraged through career counseling and models that facilitate and reward ongoing learning, then not only careers can be improved, but qualities of life can also be enhanced for lifelong learners.

Technology and Career Education

Many countries have started reforms and innovations in their educational systems in order to make schooling more "career relevant" (Papas & Stefaneas, 2001, p.1444). Skills for conflict resolution, skills to plan and prepare for work systematically, skills for problem solving, for information retrieval, and skills for lifelong learning are examples of these "career relevant" skills. So it is more important than ever that instructional design be integral to both learning and career education. Over the last fifteen years, the rapid growth of technology and the Internet have necessitated greater emphasis on both technology and on new ways to present content materials in online and virtual formats. Since there are many learning styles, not all students learn successfully in online learning environments. Students with auditory and kinesthetic learning styles, for example, may not learn as effectively online as visual learners. Students with disabilities, such as blindness, or paralysis, may need proxemics to utilize keyboards and navigate the Internet. So, more than ever, it is important to take learning styles into consideration when designing instruction. "The concepts of information technology (IT) and K-(Knowledge) economy development require input from all mankind, but teacher education professionals can play a particular role here; their reform motivation can often be a decisive argument for their education and workforce development" (Wang, T. J. 2002, pp.97-98).

Internet education seems to be gaining ground as a vehicle for education that crosses both interdisciplinary and geographic lines. "Online learning opportunities offer the potential for radically new career- enhancing learning

experiences that, it can be argued, may revolutionize education and career training practice by providing a never-before-seen structure for maintaining life balance and overcoming barriers to the preparation phase of the career development process" (Wilkinson, 1999, p.1161). But there are other traditional formats that also offer learning opportunities to students who can attend classes in traditional classroom settings. For students who may not have access to computers due to economic constraints, there are neighborhood training sites located in neighborhood centers or in public high schools that stay open in the evenings for the classes. Community colleges often share these spaces with both industrial training programs and community high schools to maximize the use of existing buildings in the area. One such example in Texas is the collaboration between Houston, Texas' Community College System and local Houston high schools, such as Sharpstown High School. In Chicago there is collaboration between a number of the Chicago City Colleges, such as Malcolm X College, and public high schools in the Chicago area to provide space for these types of training and literacy programs. New York works with a number of high schools that stay open in the evenings to house community college and local literacy classes. Ditto for Los Angeles, Dallas, and Miami, along with a number of other cities and states, are working with community colleges and local public high schools to encourage and nurture these kinds of collaborations.

In addition to collaborative-shared spaces for education and training, there are factors, such as methods of delivery that can be important to the success of career education courses in both online and traditional settings. If the intent is to reach as many students and teach specific content material, most courses lend themselves readily to online delivery. But, again, due to the differences in learning styles (Gardner, 1999) that may prevent some students form learning effectively online, there may also be other reasons why online delivery may not always be the best option, such as learning disabilities, physical handicaps, or learner reticence.

There could be adaptation challenges too, especially if a learner has trouble adapting to change. In instances where the person is a late adopter or resister, there may be some preliminary steps provided that can lead her or him to try online learning, but these steps may need to be taken incrementally. For example, the introduction of combined delivery (hybrid delivery) could allow learners to become familiar with the processes of online course delivery while taking classes in traditional classroom settings.

Information Technology Diffusion/Integration

Many universities, community colleges and for-profit institutions offer a variety of delivery methods for career education. Traditional classroom settings are becoming more rare, largely due to the ease and cost-effectiveness of online course delivery. But combined, online and classroom (hybrid) courses are often utilized to offer both face-to-face instruction and online components, and these work well for students who may have learning differences or physical handicaps. Often, if the students have physical disabilities, they can be accommodated with proxemics furnished by federal, state or local agencies, as mandated by the American Disabilities Act which can help them to navigate both the classroom and Internet environments of their classes.

Accredited institutions and organizations that offer online availability of instruction usually strive to assure that instructional designs and course delivery contain curricula that are standards-based, research-driven, sensitive to diversity, and content rich (Silverman, 2002; New York Institute of Technology, 2002; International Society of Performance Improvement, 2005; International Board of Standards for Training, Performance and Instruction, 2005; American Standards for Training and Development, 2005; American Educational Communications and Technology Standards, 2005; Standards for Online Learning, Teacher Centers, NY Inst of Technology, 2005; National Center of the Accreditation for Teacher Education, 2005; International Society of Performance Improvement, 2005). Best course design practices should include: student scaffolding of knowledge through inquiry; reflection and sharing to support learning; dialog to foster meaningful thinking; individual project work for summative evaluation; mentored and constructive criticism; and offer opportunities for higher level thinking (New York Institute of Technology, 2002).

Technology Diffusion

While there are still many places in the United States and throughout the world where technology is not readily available and may not be the best delivery mode of career training, there are a wide array of delivery methods to even the digital divide for those persons who may not have Internet technology available, such as online training that can be made available via community centers, nonprofit agency computer centers and public libraries. Education can also still be provide through the use of training material packets mailed to persons in rural areas who may not have access to computers. And there is always a way to provide "in-person" training sessions at centrally located site locations provided easy access to persons living in large metropolitan areas.

For technology diffusion to occur, a number of things must take place. Access is the first challenge, but there are others, such as innovation adoption issues. For an innovation to be adopted by the majority of learners, a critical mass of learners must choose it. This means that the innovators and early adopters must expound the virtues of the innovation, the majority of indifferent learners must see the benefits and choose the innovation, then the late adopters join the milieu and the innovation is adopted. Adaptation and integration then occur when there is sufficient history of the innovation's successes that it is transparent and its use is ubiquitous. The group no longer question its use, but chooses the innovation as a matter of course (Robinson, 1996, 1995).

The Shift from the "Information Age" to the "Cognitive Age"

The shift from knowledge acquisition and information accumulation to holistic knowledge integration has been exemplified in the multi-dimensional and interdisciplinary transformations n the way adults learn and work in the 21st century. While there will continue to be limitations of financial resources in economically challenged arenas and frustrations in the delivery of career training to underserved communities, the access to community center computers, libraries and school Internet "cafes" will allow, at minimum, some degree of scaffolding of new knowledge to provide opportunities to all learners that desire education for careers. The hope would also be that any integration of new knowledge could provide a holistic approach to integrating knowledge and help instill a desire for lifelong learning. Deeper knowledge that not only crosses over disciplines but transcends learning barriers is the goal of the schools, universities and for-profit organizations that endeavor to meet the needs of these adult learners through career education.

> Genuine computer literacy is not about learning to use tools like a word processor or a spreadsheet, but about learning a new language of events, processes, and dynamic relationships that will help make the world and its ideas more understandable, more communicable, more civilized." (Schmucker, 1999, p. 40).

Types of Career Resources Available Through the Use of Technologies

In addition to the provision of some type of career counseling to most secondary school students, community college students, university students, and for-profit school students, there are a plethora of resources available to those interested in pursuing educational opportunities to enhance or jump-start their careers. There are educational resources, such as libraries, job-seeker service organizations, entrepreneurial organizations, temporary employment services, local, state and national labor and vocational training agencies, and non-profit organizations available to assist first-time or returning career seekers. Many of these career resources can also be found through the Internet. Today there is an abundance of information available to anyone seeking to find career education and training. They can even find resume preparation online, job tips for writing job cover letters, suggestions for interviewing and even receive advice for negotiating their salary upon receiving a job offer, all online.

Online resources are also available to help support career and professional development that extend beyond conventional educational and for-profit corporations. Web logs (blogs), I-Pod pod casts, international net conferences, and web phones, all bring career resources to the fingertips of those seeking career upgrades or enhancements.

The only real caveat to those seeking jobs and career education information online, however, is the necessity to verify the information on the websites they utilize to be sure they are reliable, and this can be ascertained by requesting professional references from the web host or site webmasters; requesting confirmation of the veracity of information posted on the website; checking reputable agencies, such as the Better Business Bureau, United States Department of Education, the Chronicle of Higher Education, and other reliable sources for verification of reliable reputation of the web host or host entity; and, seeking verification of accreditation by the appropriate regional accrediting agency for the institution of interest.

Discussion

The entire issue of quality career education could loom in the balance of what is deemed "acceptable knowledge" by online learners who are influenced by different motivators from academic degree seekers, motivators, such as marketing, accessibility and practical application. It would be helpful to engage in more dialog across academic and corporate venues so that research could be shared. If this does not happen, there well may be a

growing body of dissenters who feel that "Education must 'transform' itself or become viewed as "irrelevant" (Olsen, 2001). Initiating and continuing the dialogue on collaboration in academia will be the key to interdisciplinary breakthroughs among faculty and to revitalization in adult student enrollments (Clark, Herter, & Moss, 1998). Suggested areas of research include the role of collaboration in diverse academic communities, research on instructional design in interdisciplinary project teams, and research on which factors have the most positive effects on adult learners in career education courses (Crawford, Gannon Cook & Varagoor, 1998; Gannon Cook, 2005).

Conclusion

New categories of occupations have appeared that offer opportunities to those willing to acquire the education needed for these new career paths in the world of work. Research in the field of career education now includes the research on adult learners, andragogy; community colleges, for-profit universities and technology training institutions, and will, no doubt, include research that will be conducted in these new occupational categories.

Career resources, the use of technology in instruction, and international workforce influences are important aspects of career education. Instructional models of career education that exemplify the shift from the "Information Age" to the "Cognitive Age now include the best practices of student-centered learning and the shared expertise of interdisciplinary facilitators across the range of educational institutions discussed herein and many more that may yet remain unexplored and "under the radar" of conventional and virtual educational delivery vehicles.

It is the hope that in the future, continued collaboration between the fields of higher education and career education will facilitate new prospects for adult learners in career education and offer new career development opportunities for learners in realms far beyond the electronic ones we know today.

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