The Journal of Vocational Education Research

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Printed by the Ohio State University, Columbus, OH

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This publication is available in microform. Call toll-free 800.521.3044 or mail inquiry to University Microfilms International, 300 North Zeeb Road, Ann Arbor, MI 48106.

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Volume 27, Issue 2 2002

The *Journal of Vocational Education Research (JVER)* is published three times a year in April, August, and December and is an official publication of the American Vocational Education Research Association (*AVERA*). *AVERA* was organized in 1966 to (a) stimulate research and development activities related to vocational education, (b) stimulate the development of training programs designed to prepare persons for vocational education research, (c) foster a cooperative effort in research and development activities with the total program of vocational education, other areas of education and other disciplines, and (d) facilitate the dissemination of research findings and diffusion of knowledge.

Journal of Vocational Education Research, 27(2), pp. 177.

Editor's Note

Jay W. Rojewski
University of Georgia

Volume 27, Issue 2 includes five articles that reflect the diverse nature of research on career and technical education issues. Each offers a great deal for us to consider. K. Peter Kuchinke attempts to find common ground between career–technical education and human resource development. He posits that while these two fields currently represent distinct communities of practice, we should consider an integrative approach to develop a comprehensive system of workforce education in the U.S. James H. Adams describes how meaning is ascribed to the notion of work by people involved in welfare–to–work programs. His findings provide a number of issues that professionals in vocational education need to consider. Perhaps the most important contribution Adams' work offers is a poignant reminder that those we serve are, indeed, people with thoughts, concerns, and aspirations. The third article, written by S. J. van Zolingen, outlines the results of a Delphi study that provides information about key qualifications for selected jobs. van Zoligen's results can be enable new employees to work efficiently and provides a basis for considering policy development. From the Netherlands we shift focus to the state of Ohio where Hairston describes what career–technical preservice teacher educators think about the knowledge, use, and implementation of state and national school–to–work initiatives. Her results provide direction for preservice professional development activities. Finally, Kim and Rojewski describe the possibilities for using structural equation modeling (SEM) to address problems specific to workforce education and career development. SEM and other sophisticated quantitative analytic techniques are needed to more adequately consider the complexity of work-based issues and problems.

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Journal of Vocational Education Research, 27(2), pp. 179-196.

Strengthening Ties Between Career-Technical Education and Human Resource Development

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Abstract

Building on Gray's (1997) observation of a common ground between vocational education and human resource development, the present paper seeks to extend the comparative analysis by contrasting each field in terms of its history and definition, professional standards, scope of interventions, and core bodies of knowledge. The analysis suggests that despite a shared historical, intellectual, and institutional space, vocational education and human resource development can be understood as related yet distinct communities of practice. In light of the changing nature of work and evolving career patterns of individuals, however, a further segregation of the two fields appears unwise. Instead, conceptual, theoretical, and empirical work is required to integrate vocational education and human resource development. This is required to better understand and improve the research and practice of what Copa (1996) termed education for, at, through, and about work throughout the life span with the aim of developing a comprehensive system of workforce education and workplace learning in the U.S

In 1997, Ken Gray examined the compatibility between training and development/human resource development and vocational-industrial teacher education programs in the United States, arguing that both should be seen as parts of a single professional endeavor bound together by the tie of a common mission. This shared professional purpose was to "improve the occupational status of the individual student/client . . . . in one of two ways: either by increasing (a) the individual's labor market advantage . . . . or (b) that individual's performance productivity on the job" (p. 82).

Gray's analysis is in the tradition of foundational writing that has been pursued with much vigor in both career and technical education (CTE, to adopt the name suggested by Lynch, 2000) and human resource development (HRD) in the recent past—although with differing emphases. Among CTE scholars, much effort has been focused on developing a future vision for the field and on outlining new policies and practices at both the secondary and postsecondary levels (e.g., Jacobs, 2000; Lewis, 1998; Lynch, 2000; Miller & Gregson, 1996), while the main thrust among HRD scholars has been on building an identity for the field by formulating

a coherent and defensible definition, including statements of subject matter, boundaries to related areas, and examination of dominant discourses (e.g., Hatcher, 1998; Kuchinke, 1999; Lee, 2001; McLean & McLean, 2001; Walton, 2001). Few attempts, however, have been made to integrate CTE and HRD, and this should be seen as the major contribution of Gray's essay.

Gray's rationale for the *common profession* thesis was made on three main arguments: (1) the existence of a shared set of ethical standards (promoting learning, insuring safety of students/clients, keeping of public/employer trust, and promoting the transfer to knowledge to the workplace); (2) a common intervention or product employed by all workforce education practitioners (work-related instruction to improve labor market status and/or solve human performance problems); and (3) a common knowledge base (micro- and labor economics, sociology of work, career development psychology, and curriculum/instructional design and delivery).

While Gray's thesis is certainly plausible—HRD, after all, emerged in U.S. university departments of vocational and adult education and thus shares much of their historical, intellectual, and institutional space (see, for example, McMurty, 1998)—there are also indicators of divergence that suggest that the common profession thesis is, at present, more of a desired future than actual practice. In academic departments with both CTE and HRD programs, faculty and students are often clearly identified with one field or the other. There is little overlap in terms of professional association memberships, service on editorial boards or in association leadership roles, conference attendance and presentations, publication in respective journals, or research and consulting projects. Graduate curricula in HRD often do not address issues of public vocational education nor do they address the foundations of CTE such as history, philosophy, pedagogy, or public policies (Kuchinke, 2002). HRD practitioners in business and industry and CTE teachers do not often collaborate, and neither group has much presence in the other's professional associations and industry groups. In short, while some boundary crossing exists among scholars and practitioners, HRD and CTE show signs of having evolved into distinct communities of practice (Lave & Wenger, 1990), each with its own professional and political culture, values, research directions and priorities, sources of research funding, and institutional characteristics. I believe that a further divergence of CTE and HRD will ultimately weaken both areas and hinder progress towards a comprehensive system of education, training, and development, whether in or outside of traditional school or work settings. The purpose of this paper, then, is threefold: (a) to review the current status of the fields, b) to expand the discussion initiated by Gray (1997) by addressing convergent and divergent trends; and (c) to suggest directions for positioning both within a broader system of learning and education *for, at, through*, and *about* work (Copa, 1996) within the framework of life-long learning and life-span

development.

Definitions and Scopes of Practice for CTE and HRD

Despite much recent discussion over the future of CTE, the field appears to be quite clearly bounded. In a narrower sense, CTE is seen as "a collective term . . . to identify curriculum programs designed to prepare students to acquire an education and job skills, enabling them to enter employment immediately upon . . . graduation" (Lynch, 2000, p. 155). The setting for CTE is either a high school or postsecondary institution or both (e.g., Bragg 1995), but generally focused on the prebaccalaureate level (Gray & Herr, 1998). A broader claim for CTE is made by Copa and Plihal (1996) who place CTE within a larger context:

> The purpose of vocational education is to enhance the vocational development of an educated person. Vocational development is seen as a life-long process of developing the capacity for assuming vocational responsibilities. Vocational responsibilities are the expectations for accomplishment in social and economic roles . . . characterized by caring, commitment, and connectedness . . . . Full realization of human potential in vocational responsibilities is critical to human development and the social and economic progress of nations and the world. A vocational development perspective includes attention to both short-term and long-term needs. (pp. 91-92)

The discussion of the new vocationalism has centered around this broader perspective, including the preparation of students to become lifelong learners (Lynch, n.d.) and the repositioning of vocational education as a complement to the academic curriculum—a return, as Lewis (1998) observed, to a progressive education stance advocated by John Dewey in the early part of the last century in contrast to the social efficiency philosophy of Prosser and Snedden.

With CTE located within the framework of public schools, HRD, in contrast, is viewed as education, training, and developmental activities in workplace settings, provided by employers to employees, and justified as an investment in enhancing the productive capacity of the workforce in the context of a competitive economic environment. Following a human capital logic (Becker, 1993), examples include McLagan's (1983) definition of HRD as the "integrated use of training and development, career development, and organization development to improve individual and organizational performance" (p. 7), and Swanson's (1995) definition of HRD as a "process of developing and unleashing human expertise through organization development and personnel training and development for the purpose of improving performance" (p. 208). Definitions advanced by adult educators are similar in scope—albeit from a learning rather than performance perspective. Watkins and Marsick's (1993) definition of HRD as a "combination of training, career development, and organizational development [offering] the theoretical

integration needed to envision a learning organization, but it must be positioned to act strategically throughout the organization " (p. 355) illustrates this. However, there is unease among HRD scholars over too narrow a focus on the economic returns of HRD. Kuchinke (1999), for example, classified alternative philosophies of HRD by examining the meaning of the term development, which so prominently features in the name of the field. He distinguished among three prominent approaches: person-centered—following the tenets of humanistic and existentialist philosophies; production-centered—focused on immediate production and performance needs; and principled problem-solving—in line with a progressive education agenda and cognitive-developmental psychology.

The most comprehensive definition advanced by U.S. scholars—who also write extensively on global issues— is that "HRD is any process or activity that, either initially or over the long term, has the potential to develop adults' work-based knowledge, expertise, productivity, and satisfaction, whether for personal or group/team gain, or for the benefit of an organization, community, nation, or, ultimately, the whole of humanity" (McLean & McLean, 2001, p. 1071).

Thus, while CTE is located within institutional settings—predominantly high schools and community/technical colleges—HRD is more loosely structured and exists in the space of work organizations and the plethora of formal and informal work-based learning activities. These different institutional settings, as subsequent sections will address, shape the educational enterprise and activities in each in substantial ways. In the next section, a brief review of the evolution, status, and provision of professional preparation for roles of CTE and HRD practice will be provided to further address similarities and differences.

History and Status of CTE and HRD

The long and distinguished history of vocational education requires little explanation in this context (see, e.g., Barlow, 1967; Lazerson & Grubb, 1974; Lewis, 1998; Wirth, 1980), nor does the field's proximity to HRD—both are concerned with work education, training, and development (defined, at times, narrowly, at times broadly); both have their roots in early training models, such as apprenticeships, guild training, and on-the-job training; both aim at developing and maintaining high-level skills and performance within work and employment contexts; both face the tension of addressing the needs of economic and social systems, of organizations, and individuals. While vocational education has evolved within the context of federal legislation since the inception of public funding with the Smith-Hughes Act in 1917, training and development in business and industry (and what was later to become the profession of HRD) has developed independent of federal, state, or local policy mandates and often more closely tied and responsive to the changes in product, service, and processes in public and private organizations (McMurty, 1998). Thus, HRD evolved as a system of workforce

training and development, at times augmenting, at time substituting for, at times simply continuing vocational education in the workplace.

The importance of the human element in work organizations was first formally acknowledged in the 1920s with a series of studies involving a Western Electric plant in Hawthorne, Illinois (Roethlisberger, 1941), and gave rise to the human relations movement in organizational psychology that stressed the critical role of skilled and motivated employees for both firm performance and individual and societal well-being and progress, a sharp departure from the mechanistic tradition of Fordist production techniques and Taylorist scientific management of earlier decades. Decades later, during the late 1970s and early 1980s, a transformation of similar magnitude occurred, this time brought upon by the increase in global competition, changing demographic make-up of the workforce, demands for high quality goods and services, and rapid changes in process and production technologies (Noe, 1999). Firms responded to these challenges by shifting from what Barley and Kunda (1992) termed rational control—reliance on formal planning and hierarchies, bureaucratic work systems, and strict rules and procedures—to normative control, characterized by broad employee involvement, fewer layers of authority, increased span of tasks and relationships, and increased emotional involvement with work. This new type of employment relationship was at the basis of new models of managing organizations, such as quality management, process reengineering, organizational learning, culture change, and knowledge management, all of which place far greater cognitive and affective demands on employees—especially at the lower levels of the organizational hierarchies but also for professionals and managerial ranks.

In CTE, these changes have resulted in frameworks such as SCANS and the notion of high performance skills but have not been fully explored or implemented to keep pace with or abreast of current workplace demands (Lynch, 1996; McMurty, 1998; Office of Educational Research and Improvement, 1994). As a result of changes in virtually all sectors of the economy, the role of HRD has expanded. Two influential reports published by the Carnegie Foundation (Eurich, 1985, 1990) first pointed to this new role by arguing that private and public sector organizations had, in fact, established a parallel educational system that, in scope, importance, and expenditure, rivaled the public one. The tenor of Eurich's reports reflected the prevailing sense of dissatisfaction with public education and fear that the country was being put at risk in an international comparison (e.g., National Commission on Excellence in Education, 1993) and suggested that HRD arose from the need for remedial education and training brought upon by a deficient system of public education. Although HRD in the for-profit and not-for-profit sectors—including government, military, education, healthcare—continues to provide remedial education (e.g., basic literacy and math), its scope is far broader and includes a wide range of work-related skills, such as leadership,

communication, team work, technology, career planning, motivation, and many others. These are taught in an equally wide range of pedagogical approaches, from formal classroom training to self-directed study using the Internet, from learning-by-doing to coaching and mentoring, from in-house designs to collaboration with colleges and universities and from rote memorization to the *great books* approach. Direct expenditures in formal training alone have grown steadily over the years and in 1996 were estimated at $60 billion with indirect costs and non-formal training (such as on-the-job and self-directed learning) factored in, this number is estimated at $210 billion (Watkins, 1998) or about 1.8 per cent of payroll (Organisation for Economic Co-Operation and Development, 1999, Watkins, 1998). This can be contrasted with 1996 expenditures for formal education of $238 billion (with $94 billion of that in higher education) (Watkins, 1998). Given the shift towards a more knowledge-intensive economy and rapid changes in work processes, products, and services, there is every indication that HRD activities will remain a vital component of organizational strategy in all sectors of the economy (see Scott & Meyer, 1991).

Professional Preparation and Labor Markets for CTE and HRD

HRD practitioners are drawn from a wide variety of backgrounds and academic preparation with little formal requirements for certification or credentialing. Many, but by no means all, attain their professional preparation in U.S. colleges and universities. While training and development curricula played a relatively minor role in many departments of vocational education in the 1970s and early 1980s, their enrollments and stature increased over the past 15 years to a point where they are now the "bread and butter activity" (Gray, 1997, p. 80), drawing large enrollments of certificate, master's and doctoral students. HRD certificate programs and even introductory courses face strong demand, also from non-education undergraduate majors who are seeking employment skills. While most programs were established in the 1980s, the decade of the 1990s saw an increase by about 15% (Kuchinke, 2002), and by 1997, some 250 U.S. colleges and universities were offering certificates and degrees in HRD and related fields, such as instructional technology and performance technology (ASTD, 1996). Kuchinke reported enrollment data for 55 HRD programs at large, doctoral-granting institutions and found that average enrollments, while substantial (M=138 students), had declined at the master's level between 1991 and 1999 by almost one-half (M=172 students in 1991 vs. 93 students in 1999) and doctoral level enrollments had grown by just over ten percent (M=45 students in 1991 vs. 51 students in 1999). Whether this indicates a general leveling-off of the demand curve or is due to the strong labor market of the late 1990s, is open to further investigation.

At the same time, CTE enrollments have declined because of changing

enrollment patterns in high school, the availability of alternative credentialing for vocational instructors, perceived lack of relevance and quality of vocational curricula, and a shift toward academic course-taking (Lynch, 2000). In response, many academic university departments reduced their program offerings, closed down altogether, or shifted their emphases. Lynch (1998) offered enrollment information of the various vocational subject areas and concluded that most had experienced declines over the previous decade, although comprehensive vocational education enrollments had increased substantially and the overall rate of decline had slowed compared to previous reports.

Labor market demand characteristics for HRD practitioners are difficult to obtain because the profession is not identified in the Department of Labor's information system. Rather, the most recent edition of the *Occupational Outlook Handbook* (U.S. Department of Labor, 2000) includes HRD in two broader job categories, (a) Human Resources (HR), Training, and Labor Relations Specialists and Managers and (b) Management Analysts. The former includes a variety of job titles such as job analyst, training and development manager, and training specialist. In 1998, about 600,000 jobs existed for this classification in the U.S., three of five positions were at the specialist level, two of five at the managerial level. Roughly one million employees classified by D.O. T. titles recognized as HR practitioners, with the boundaries between HRD and more general HR job responsibilities likely to be fluid. A reference text on career information (Macmillan, 1999) describes two major HRD roles, training specialist and organization developer. For both, employment outlook and job growth are listed as greater than average because of increased needs for human capital development in business, industry, and not-for-profit and public organizations and institutions. The guide also indicates strong competition for the best jobs as the profession draws from a variety of academic majors.

Lynch (1998) provided information on the demand of vocational teachers indicating growing concern by state and local policy makers over the dearth of academically trained vocational teachers entering the field and notes that "with evidence of a reduced commitment and capacity to produce teachers for America's vocational and technical education system [and] the vast majority of . . . teachers . . . retiring . . . a high demand for their replacements [can be forecast]" (p. 27).

Thus, while over the past 15 years there has been intense debate over the efficacy and future of vocational education, with concerns over the supply of qualified teaching personnel, administrative leadership, and academics, HRD programs and enrollments have expanded in numbers and size, although there are indications of a leveling-off of the growth curve of new programs and decline in enrollments in the recent past. Nonetheless, despite a somewhat fuzzy identity brought upon by a wide scope of the profession and some unease among traditional educators over the fit of HRD in teacher training institutions, HRD programs

appear to be established in U.S. Colleges of Education where they seem to provide sizeable enrollments and a bridging function to non-school populations and to other units on campus concerned with work studies.

Professional Standards and Ethics

Professions develop by claiming authority over a distinct set of problems of practice, ownership of a distinct body of advanced knowledge, and standards for professional practice that are formalized and enforced (Abbott, 1988).

In the teaching professions, standards are maintained through the system of credentialing and licensure that applies to most but not all disciplines. In vocational education, in particular, there are several tracks available to those wishing to enter the profession. In general, according to Lynch (1998),

> most vocational education teachers—secondary and postsecondary—have at least a bachelor's degree, some education courses, and occupational experience. However, when segmented, 73 percent of beginning trade and industrial teachers and 50 percent of beginning health occupation teachers do not hold a baccalaureate degree . . . . Rather, these vocational teachers are credentialed in their respective states to teach as a result of some significant amount of occupational experience. (p. 23)

Certification and credentialing in the business context are restricted in range, with some occupations, such as accounting or health services requiring formal assessment of competence and strict requirements for continuing education and training to maintain the privilege to practice in the profession. However, many business occupations, among them HRD, have few formal qualifications. While informal observations suggest that large organizations increasingly require university degrees for even entry-level positions, many organizations staff their human resource departments with employees without formal education in HRD. Barriers to entry into HRD positions are generally low, and the function is often located within human resource or personnel units with comparatively low levels of power and influence compared to other functions and units. "Despite common claims that 'people are our most important asset,' surveys reveal that many organizations staff their 'people departments' with large portions of non-college-educated individuals and even larger proportions without degrees in HR [human resources] or related fields" (Rynes & Trank, 1999, p. 811). Human resource employees, even with college degrees, receive lower starting salaries than most other business occupations (National Association of Colleges and Employers, 1999), have shorter career paths, and fewer chances of moving into executive positions (Rynes & Trank).

HRD industry associations provide professional development opportunities in the field and award professional certifications, such as the ASTD's certificate

program in Human Performance Improvement consisting of six three-day modules offered through a consortium of colleges and universities throughout the country. The largest human resource management professional association, the Society for Human Resource Management (SHRM), offers certification at two levels, Professional in Human Resources (PHR) and Senior Professional in Human Resources (SHRP) through the Human Resource Certification Institute and to nationally recognized standards. Certification is available based on a minimum number of work experiences in human resources and passing scores on a national exam. Preparation options include preparatory courses, self-study, and academic programs at colleges and universities. Re-certification is required every three years by means of re-testing or completion of formal professional development. As of June, 2000, over 43,000 practitioners had undergone and achieved certification in the U.S. (SHRM, 2001). However, there is little research available to show the effects of voluntary certification on individuals' career progression, their performance, or organizational hiring preferences. Research from the UK, where there is a formal national-level certification system for HRD, suggests that despite a vocational qualification system for the profession, many organizations employ non-certified individuals, raising questions about the perceived value of certification system (Institute for Personnel and Development, 1999).

Ethical standards for CTE and HRD have been formulated, and these include the principles that "all interventions should be conducted in a manner that (a) promotes learning, (b) ensures safety of students/clients, (c) does not violate public/employer trust, and (d) promotes the transition of knowledge to the workplace" (Gray, 1997, p. 83). Academy of Human Resource Development (AHRD) membership of about 800 endorsed a set of standards on ethics and integrity (AHRD, 1999) that include general principles of professional competence, integrity, professional responsibility, respect for people's rights and dignity, concern for other's welfare, and social responsibility; as well as standards for research and evaluation, advertising, publication of work, privacy/ confidentiality, teaching/facilitating, and resolution of ethical issues and violations. This rather comprehensive document was drafted with input from similar statements by other academic and professional associations and attempts to address the many potential ethical issues inherent in workplace situations within a liberal framework. As a profession, HRD commits itself to a set of values based on the belief that HRD practitioners "understand that a healthy economy, healthy organizations, and a healthy ecosystem are intricately interconnected. [HRD practitioners] apply and make public their knowledge of learning and performance in order to contribute to human welfare [and] mitigate the causes of human suffering [and] strive to advance …human development and a sustainable future" (p. 5). Thus, the belief in the commensurability of social, organizational, and individual progress appears to underlie the profession, just as this belief underlies the socio-technical systems

design approach that much of organization development practice is based upon.

Both fields, it appears, have comparatively low occupational status. CTE programs are often perceived as lower in status than academic programs. In business and industry, HRD is often seen as less influential than other core functional areas, such as marketing and operations. In the case of CTE, the availability of alternative credentialing raises questions over the pedagogical preparedness and currency of knowledge among CTE teachers. In the case of HRD, the low barriers to entry into the field might contribute to its low status in the organizational hierarchy and raise questions over the quality of educational practice these practitioners can provide.

The Knowledge Bases of CTE and HRD

The question of the requisite knowledge of practitioners in both fields can be framed generally and conceptually (e.g., discussions of the subject matter of vocational education, Copa, 1992; Copa & Tebbenhoff, 1990) or within the context of academic preparation of practitioners, the approach taken here.

In HRD curriculum research, the frameworks most often applied are competency studies undertaken by McLagan (1989, 1996) who identified a series of competencies and professional roles for successful HRD practice. Empirical studies repeatedly found that the curriculum of even leading HRD university programs in the country failed to address all or even the majority of required competencies and thus raised questions over their ability to prepare practitioners for several of the advanced and emerging roles in the field (Baylen, Bailey, & Samardzija, 1996; Dare & Leach, 1999; Leach, 1993). Most programs focused on content related to instructional design and development and neglected emerging roles of performance technologist, change agent, and manager of HRD. Kuchinke's (2002) investigation of the core curriculum of 55 leading HRD graduate programs confirms these findings, suggesting that the preparation of future leaders in the field can and should be improved, if the curriculum is to keep abreast of the demands of current practice. In particular, where the requirements of practice call for the ability of transformational thinking, to effect social change, and translate insights into the dynamics of power and politics into action, narrow curricula focused on the mechanics of the profession are likely insufficient. Here, institutional barriers often impede progress: With HRD programs located in Colleges of Education, the inclusion of subject matter that has traditionally been the domain of departments of organizational psychology, institutes of labor and industrial relations, organizational sociology, or management is difficult—despite the fact that the problems of professional practice rarely conform to disciplinary boundaries and require a cross-disciplinary approach. Another institutional barrier is the fact that Colleges of Education may view themselves as focused on schooling of children and youth instead of learning across the life span in the broader sense,

and thus view the inclusion of action research and organization science content as foreign to the mission of a teacher training institution (this despite the fact that educational institutions are themselves organizations that have HRD functions and frequently profess the need for change and transformation).

Lynch (1998) summarized the state of vocational teacher education indicating that the implementation of the new vocationalism might be limited by current curriculum. Analyzing university vocational teacher education curriculum design, he found that graduates received industry- or business-based occupational experiences and subject matter specific course work, as well as instruction in working with at-risk and special needs populations, computer applications, student advising, and preparation to work with business and industry groups. The average course-taking pattern was deficient, however, in liberal arts subjects and academic areas, compared to other teacher preparation curricula. This might impede vocational teachers' abilities to work with colleagues on integrating vocational and academic courses and to teach basic skills in vocational education programs.

Notably absent from U.S. curriculum in both fields are the postmodern or critical perspectives that are not part of mainstream debate in either field. These perspectives still appear to come more often from outside than from within; examples in CTE are the works of Kincheloe (1995) and Giroux, (1988) but also more recently from Gregson (1996), Lakes and Bettis (1995), and Rehm (1999). In the organizational sciences, major critiques on the dominant functionalist and rationalist paradigm have been advanced by Aktouf (1992) and also more recently by (Calas & Smircich, 1999). These voices need to become much stronger and inform the discourse in the fields.

In the long run, both fields can grow only if academic programs are able to prepare their students to fulfill the roles and responsibilities required by clients and stakeholders as well as those claimed conceptually and theoretically. It appears that current academic programs might be in need of revision and improvement if, in fact, the preparation of practitioners for either field is to reflect the claims of a new type of vocational education and the broader reach of HRD practice.

Conclusion

Gray's central thesis was that CTE and HRD formed a common profession based on their shard mission, standards and ethics, intervention, and body of knowledge. While each field, according to Gray, laid claim to distinct characteristics, based on their respective institutional settings, substantial communalities existed between the two. In the preceding pages, I attempted to extend the analysis by reviewing the status of each field, definitions and scopes of practice, standards and ethics, and bodies of knowledge.

Both CTE and HRD are fields whose complexity is increasing in response

to the rising complexity of the social, economic, political, and technological environments. Thus, no single definition or mission appears sufficient, rather it makes sense to speak of a multitude of perspectives that mirror the multi-faceted external environments. Both fields share a range of understandings that might be depicted on a continuum with narrow skill training (for the first job and at the workplace) on one end and broad developmental goals (for life-long learning and vocational development) on the other. Both short-term and long-term views appear needed: individuals depend on learning specific skills but also need to understand the broader context of their occupation. Organizations will not function without competence in the routine tasks they perform but also need to foster the ability to grow and adapt for the long term. Thus, a useful taxonomy for the fields might consist of competence of working *within* an existing system but also competence in working *on* the system, that is, to effect systemic change based on analysis, insight, and learning (Swanson, 1995). To implement change, however, a framework for a desirable future is required, and here the ability of developing a vision of a worthwhile and sustainable future is needed. Lastly, the rate of change seems to dictate that much competence needs to be acquired in the work situation throughout the span of an individual's career and the life of an organization. Thus, competence is gained, refined, shaped, and altered while working instead of exclusively during the preparatory stages of vocational development. This is expressed by the notion of life-long learning that has been embraced by various international organizations, such as World Bank, International Labor Organization, and United Nations organizations. Thus, four critical facets of the professional endeavor of CTE/HRD consist in learning *for, at, through,* and *about* work, and these facets are interdependent and mutually reinforcing. A single focus on education *for* work is no longer sufficient in a complex world, and this realization appears to be behind the many calls for a new vocationalism and a comprehensive definition of HRD. From a systems perspective, the prevailing lack of integration of CTE and HRD should be regarded as counterproductive: both fields are interdependent and form parts of a system of workforce education and workplace learning. Both share a common, yet not clearly articulated value base that draws on Deweyan progressive pragmatism and the search for inclusive solutions within sustainable economic and social environments, a value base that underlies the socio-technical and humanist tradition in HRD. To this integrated field, vocational education can contribute depth of analysis, a philosophy of care and concern, and a detailed vision of the goals and purpose of education—areas that are clearly lacking in contemporary, behavioristic-oriented organization research. Examples might include the notion of good work, research on the meaning of work, the role of work outside of formal employment settings, and the role of work organizations within a civil society.

In turn, HRD can contribute breadth and proximity to organizational issues and decision-making and inform those who educate youngsters for a productive life. Initial attempts at formulating this synthesis include work by Miller (1996), Miller and Gregson (1996), and Lynch (1996). Both CTE and HRD need to be integrated into a system of workforce education and workplace learning that reflects the rapid changes in work systems, products, services, processes, and technologies. The system also needs to account for the changing expectations on work by different populations—defined by life-goals, and cultural and generational values—as well as to changes in career pattern and paths—including issues of education and development *after* work, i.e., after formal employment and career. Lastly, both CTE and HRD are presently deficient of adequate consideration of alternative epistemological approaches, in particular critical theory and postmodernity, to expand the discourse from the traditional Dewey/Prosser dichotomy that has dominated reasoning and scholarship in both fields.

While this appears to be an ambitious agenda in a time of diminishing resources and competing priorities, a coherent and integrated framework for work-related education and development might contribute to raising the visibility and status of both fields and reclaim the central role of issues of work and education in the public mind and the intellectual discourse. Here, views from abroad might be particularly insightful. In the international comparative context, the divide between CTE and HRD appears as a U.S. exception. In countries with stronger central workforce education policies and systems, like the UK, there are far closer ties between the vocational qualification system and HRD in business organizations. There, national entities such as the CIPD (Chartered Institute for Personnel and Development, 1999) are a focal connection for bridging vocational education and the employment system, with prestigious national awards, such as the coveted Investor's in People (1996) award to businesses with progressive training and development practices and policies reinforcing public policy. There, a recent series of books and journal articles have addressed the issue of a comprehensive and seamless system of workplace learning, both in school and out of school and across the life span (for an essay review see McCormack, 2000). In less industrialized countries, vocational educators routinely provide the entire range of education, training, and development services to multiple age groups and in many institutional and organizational settings.

Gray's thesis of the tie that binds CTE and HRD requires a bold vision for a comprehensive and integrated system of learning that bridges school and organizations as places of learning and places of working. This system must be based on sound educational principles and values and enhance the productive capacity and potential of individuals, teams, organizations, and, ultimately,

communities and societies.

References

Abbott, A. (1988). *The system of professions: An essay on the division of expert labor*. Chicago: University of Chicago Press.

AHRD. (1999). *Standards of ethics and integrity*. Baton Rouge, LA: Author.

Aktouf, O. (1992). Management and theories of organizations in the 1990s: Toward a critical radical humanism? *Academy of Management Review, 17*(3), 407-431.

ASTD. (1996, November). *Academic directory: Programs in human resource development 1997*. Alexandria, VA: American Society for Training and Development.

Barley, S. R., & Kunda, G. (1992). Design and devotion: Surges of rational and normative ideologies of control in managerial discourse. *Administrative Science Quarterly, 37*, 363-399.

Barlow, M. L. (1967). *History of industrial education in the United States*. Peoria, IL: Bennett.

Baylen, D. M., Bailey, M. L., & Samardzija, M. (1996). Revisiting perceptions of HRD roles: Implications for HRD curricula. In E. Holton, III (Ed.), *Proceedings of the 1996 Academy of Human Resource Development conference* [Section 33-1]. Baton Rouge, LA: Academy of Human Resource Development.

Becker, G. S. (1993). *Human capital: A theoretical and empirical analysis, with special reference to education*. Chicago: University of Chicago.

Bragg, D. D. (1995, May). Linking high schools to postsecondary institutions: The role of Tech Prep. In W. N. Grubb (Ed.), *Education through occupations in American high schools, Vol. II* (pp. 191-211). New York: Teachers College Press.

Calas, M. B., & Smircich, L. (1999). Past postmodernism? Reflections and tentative directions. *Academy of Management Review, 24*(4), 649-671.

Chartered Institute for Personnel and Development. (1999). *Qualification routes*. London: Author.

Copa, G. H. (1992). *A framework for the subject matter of vocational education* (Report No. MDS 095). Berkeley, CA: National Center for Research in Vocational Education.

Copa, G. H. (1996, Winter). *Classnotes—VoEd 8110: Comparative systems of vocational education*. University of Minnesota, Department of Work, Family, and Community Education.

Copa, G. H., & Plihal, J. (1996). General education and subject matter education components of the vocational teacher education program. In N. K. Hartley & T. L. Wentling (Eds.), *Beyond tradition: Preparing the teachers of tomorrow's workforce* (pp. 91 – 112). Columbia, MO: University Council for Vocational Education.

Copa, G. H., & Tebbenhoff, E. (1990). *Subject matter of vocational education: In pursuit of foundations* (Report No. MDS-094). Berkeley, CA: National Center for Research in Vocational Education.

Dare, D. E., & Leach, J. A. (1999). Preparing tomorrow's HRD professionals: Perceived relevance of the 1989 competency model. *Journal of Vocational and Technical Education, 15*(2), 5-18.

Eurich, N. P. (1985). *Corporate classrooms: The learning business: A report on education in American business and industry*. Princeton, NJ: Carnegie Foundation for the Advancement of Teaching.

Eurich, N. P. (1990). *The learning industry: Education for adult workers*. Princeton, NJ: Carnegie Foundation for the Advancement of Teaching.

Giroux, H. A. (1998). *Teachers as intellectuals: Towards a critical pedagogy of learning*. South Headly, MA: Bergin and Garvey.

Gray, K. (1997). Seeking a 'tie that binds': Integrating training & development/human resource development and teacher preparation. *Journal of Industrial Teacher Education, 34*(4), 80-86.

Gray, K. C., & Herr, E. L. (1998). *Workforce education: The basics*. Boston, MA: Allyn & Bacon .

Gregson, J. A. (1996). Continuing the discourse: Problems, politics, and possibilities of vocational curriculum. *Journal of Vocational Education Research, 21*(1), 335-364.

Hatcher, T. (1998). An alternative view of Human Resource Development. In B. R. Stewart & H. C. Hall (Eds.), *Beyond tradition: Preparing HRD educators for tomorrow's workforce* (pp. 33-54). Columbia: University of Missouri, University Council for Workforce & Human Resource Education.

Institute of Personnel and Development. (1999). *Training and development in Britain, 1999: The first IPD annual report.* London: Author.

Investors in People. (1996). *The investors in people standard*. London: Author.

Jacobs, J. (2000, Fall). What is the future for postsecondary vocational education? *Update on Research and Leadership, 12*(1). University of Illinois at Urbana-Champaign: Office of Community College Research and Leadership.

Kincheloe, J. L. (1995). *Toil and trouble: Good work, smart workers, and the integration of academic and vocational education*. New York: Peter Lang.

Kuchinke, K. P (1999). Adult development towards what end? A philosophical analysis of the concept of human resource development. *Adult Education Quarterly 49*(4), 148-162.

Kuchinke, K. P. (2002). Institutional and curricular characteristics of leading graduate HRD programs in the U.S. *Human Resource Development Quarterly, 13*, 127-144.

Lakes, R. D., & Bettis, P. J. (1995). Advancing critical vocational education research. *Journal of Vocational Education Research, 20*(2), 5-28.

Lave, J., & Wenger, S. (1990). *Situated learning*. Cambridge, England: Cambridge University.

Lazerson, M., & Grubb, W. N. (1974). *American education and vocationalism*. New York: Teachers College.

Leach, J. A. (1993). Preparing tomorrow's business and industry trainers. *Journal of Vocational and Technical Education, 9*(2), 4 - 16.

Lee, M. (2001). A refusal to define HRD. *Human Resource Development International, 4*(3), 327-342.

Lewis, T. (1998). *Toward the 21st century: Retrospect, prospect for American vocationalism* (Information Series No. 373). Columbus, OH: ERIC Clearinghouse on Adult, Career, and Vocational Education.

Logan, J. P. (1998). Employment settings for human resource development professionals. In B. R. Stewart & H. C. Hall (Eds.), *Beyond tradition: Preparing HRD educators for tomorrow's workforce* (pp. 71-90). Columbia, MO: University Council for Workforce & Human Resource Education.

Lynch, R. L. (1996). The past, present, and future of vocational and teacher education. In N. K. Hartley & T. L. Wentling (Eds.), *Beyond tradition: Preparing the teachers of tomorrow's workforce* (pp. 1-21). Columbia, MO: University Council for Vocational Education.

Lynch, R. L. (1998). Vocational teacher education in U.S. colleges and universities, and its responsiveness to the Carl. D. Perkins Vocational and Applied Technology Education Act of 1990. In A. Gamoran (Ed.), *The quality of vocational education: Background papers from the 1994 national assessment of vocational education* (pp. 5-42). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

Lynch, R. L. (2000). High school career and technical education for the first decade of the 21st century. *Journal of Vocational Education Research, 25*(2), 155-198.

Lynch, R. L. (n.d.). *A vision of high school career and technical education for the 21st century*. Washington, DC: Department of Education, Office of Vocational and Adult Education. Draft Report.

McCormack, B. (2000). Workplace learning: A unifying concept? *Human Resource Development International, 3*(3), 397-406.

Macmillan. (1999). *Career information center (7th), Vol. 3: Computers, business, and office*. New York: Author.

McLagan, P. A. (1989). *Models for HRD practice*. Alexandria, VA: American Society for Training and Development.

McLagan, P. A. (1996) Great ideas revisited: Creating the future of HRD. *Training and Development, 50*(1), 60-65.

McLagan, P. A. (Ed.). (1983). *Models for excellence: The conclusions and recommendations of the ASTD training and development competency study*. Washington, DC: American Society for Training and Development.

McLean, G. N., & McLean, L. D. (2001). If we can't define HRD in one country, how can we define it in an international context? In O. A. Aliaga (Ed.), *AHRD 2001 conference proceedings* (pp. 1064-1071). Baton Rouge, LA: Academy of Human Resource Development.

McMurty, J. R. (1998). The role of vocational teacher education in human resource development. In B. R. Stewart & H. C. Hall (Eds.), *Beyond tradition: Preparing HRD educators for tomorrow's workforce* (pp. 91-116). Columbia: University of Missouri, University Council for Workforce & Human Resource Education.

Miller, M. D. (1996). Philosophy: The conceptual framework for designing a system of teacher education. In N. K. Hartley & T. L. Wentling (Eds.), *Beyond tradition: Preparing the teachers of tomorrow's workforce* (pp. 53-72). Columbia, MO: University Council for Vocational Education.

Miller, M. D., & Gregson, J. A. (1996). A philosophical view for seeing the past of vocational education and envisioning the future of workforce education: Pragmatism revisited. In A. J. Pautler (Ed.), *Workforce education: Issues for the new century* (pp. 21-34). Ann Arbor, MI: Prakken.

National Association of Colleges and Employers. (1999). *Salary survey, 38*(1). Washington, DC: Author.

National Commission on Excellence in Education. (1993). *A nation at risk: The imperative for educational reform*. Washington, DC: Author.

Noe, R. A. (1999). *Employee training and development*. Boston, MA: McGraw-Hill.

Office of Educational Research and Improvement. (1994). *National assessment of vocational education: Interim report to Congress*. Washington, DC: U.S. Department of Education, Author.

Organisation for Economic Co-Operation and Development. (1999). *Human capital investment: An international comparison*. Paris, France: Author.

Rehm, M. L. (1999). Vocation as meaning making narrative: Implications for vocational education. *Journal of Vocational Education Research, 24*(3), 145-159.

Roethlisberger, F. J. (1941). *Management and morale*. Cambridge, MA: Harvard University.

Rynes, S. L., & Trank, C. Q. (1999). Behavioral science in the business school curriculum: Teaching in a changing institutional environment. *Academy of Management Review, 24*(4), 808-824.

Scott, W. R., & Meyer, J. W. (1991). The rise of training programs in firms and agencies: An institutional perspective. *Research in Organizational Behavior, 13*, 297-326.

SHRM. (2001). Certification count by area as of June 30, 2001. Retrieved from, http://www.shrm.org/hrci

Swanson, R. A. (1995). Human resource development: Performance is the key. *Human Resource Development Quarterly, 6*(2), 207-213.

U.S. Department of Labor (2000). *Occupational outlook handbook, 2000–01 edition.* Washington, DC: Bureau of Labor Statistics.

Walton, J. (2001). HRD—The power of definitions. In O. Aliaga (Ed.) *Proceedings of the 2001 annual AHRD conference*. Baton Rouge, LA: Academy of Human Resource Development.

Watkins, K. E. (1998). Foundations for HRD in a knowledge era. In B. R. Stewart & H. C. Hall (Eds.), *Beyond tradition: Preparing HRD educators for tomorrow's workforce* (pp. 55-70). Columbia, MO: University Council for Workforce & Human Resource Education.

Watkins, K. E., & Marsick, V. J. (1993). *Sculpting the learning organization: The art and science of systematic change*. San Francisco: Jossey-Bass.

Wirth, A. G. (1980). *Education in the technological society: The vocational-liberal studies controversy in the early twentieth century*. Washington, DC: University Press of America.

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Journal of Vocational Education Research, 27(2), pp. 197-216.

Going To Work: An Examination of the Meaning of Work in Welfare–to–Work

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Abstract

With the enactment of the Personal Responsibility and Work Opportunity Reconciliation Act (P.L. 104–193) of 1996, also known as the Welfare–to–Work Act, Aid to Families with Dependent Children was abolished and replaced with Temporary Assistance to Needy Families (TANF). A new system of block grants to states for TANF was created, changing the nature and provision of welfare benefits in America. Many have declared this legislation to be a sweeping success, although a few have called it a failure. Quantitative statistics seem to indicate unparalleled success, while qualitative analysis seems to question this widely held assumption. This study focuses attention on the realities of some recipients of the Welfare–to –Work legislation in hopes of gaining a better understanding of how this new legislation affects them, the ones with the most to gain or lose. This case study examines how welfare recipients in one welfare–to–work program in a midwestern state understand the meaning of work.

The original Aid To Families With Dependent Children (AFDC) legislation was passed as a component of the Social Security Act of 1935 with its original mission to provide financial aid to children not being supported by a parent. By 1940, one million recipients were receiving funds, and by 1994 this figure had risen to more than 14.2 million or 5.5% of the entire population (Abramovitiz, 2000). Under AFDC, cash assistance was provided for a diverse population of Americans, which included Caucasians, Hispanics, African Americans, Native Americans, and immigrants with great emphasis on educational opportunities such as Job Opportunities and Basic Skills Training (JOBS) to help transition welfare recipients into the workforce.

The Personal Responsibility and Work Opportunity Reconciliation Act (P.L.104–193), more commonly known as the 1996 Welfare Reform Bill, halted many of these educational opportunities. A new system of block grants to the states for Temporary Assistance for Needy Families (TANF) was created, changing the nature and provision of welfare benefits in the United States. "Work First" initiatives were enacted in most states with the primary focus being centered on

getting welfare recipients to go to work—any type of work as exemplified by Kirk Fordice, the Republican governor of Mississippi, who stated, "The only job training that welfare recipients need is a good alarm clock" (Abramowitz, 2000). Opponents of the emphasis on work over training and education note that over one half of all single mothers on welfare have a prior work history, have worked while receiving benefits, and left welfare rolls within two years in response to the availability of decent paying jobs with adequate transportation, child care, and health benefits. They further argue that if individual financial self-sufficiency is the goal for welfare reform, educational opportunities that enhance future earning potential should be maximized. Critiquing the "Work First" initiative, McCallum (1998) asserted that the current Welfare–to–Work legislation benefits business and corporations while discriminating against minorities and women. "This policy choice not only provides the market with cheap labor, but it also continues a racial and gendered history of denying education and providing minimal financial compensation for women, especially women of color" (p. 53).

Explaining the ideological differences of these two sides, Cohen (1998) pointed out that the new legislation is a shift away from the *human capital approach* to a "Work First" approach.

> Some welfare experts and policymakers advocate providing education and training to prepare welfare recipients for jobs that will eventually help them leave poverty—often called the human capital approach. Others advocate placing welfare recipients immediately in jobs whenever possible, even if these jobs pay wages below the poverty level. These "Work First" proponents argue that welfare recipients learn more from an actual job than from any educational program. (p. 1)

The success of the new legislation continues to be a source of debate. For example, Newman (1999) cited evidence to indicate that since 1996 welfare benefits have been greatly reduced as people moved off welfare rolls into work. Abramovitz (2000) stated that

> between 1994 and December 1998 the welfare rolls plummeted more than 40%. A 1999 evaluation of the Greater Avenues For Independence (Gain), the Los Angeles welfare-to-work program, stated that the job-search-first philosophy raised employment and earning and decreased welfare payments. This study stated that job-search-first programs could work for recipients who lack education credentials, and that education and training are not the sole road to success. (Manpower Demonstration Research Corporation, 1999)

Yet, others have argued that these figures are misleading because they say little about how people's lives (both economically and personally) have changed for the better or worse since the new legislation. As studies have documented (Abramotivz, 1996; Kincheloe, 1999; Newman, 1999), these supposed success

stories of people moving off welfare to work do not reveal the grim reality that most have yet to leave poverty behind. For example, a study conducted in 2001 by the Manpower Development Research Corporation documents that, although it is noteworthy that many current and former welfare receipts achieved high employment stability, the majority of jobs were low-wage jobs with earnings that put their family below the official poverty level. Furthermore, only 2 out of 5 jobs held any type of fringe benefits. The study concluded that nearly all women face barriers to employment, which included their own or child's health problems and mental depression.

Albelda (1999) pointed out, after the passage of the welfare–to–work legislation three out of every five former welfare recipients in South Carolina were working an average of 34 hours a week at a rate of $6.34 an hour. This annual wage of less than ten thousand dollars still leaves these recipients well below the level of poverty. Critics of the legislation point out that attempts to eliminate welfare must have the concomitant commitment to eliminate poverty.

This study extends preceding research pointing to the need for critical analysis of the success of welfare–to–work. Central to this study is the imperative to reframe the question of success from "What is the success rate in moving people from welfare–to–work?" to "What is the success rate in moving people from welfare to good work?" Toward that end, I describe and analyze the meaning of work as perceived and enacted by welfare recipients involved in a TANF program in the midwestern United States. This study is significant because it addresses a gap in the welfare–to–work literature about the meaning of *good work* and the implications of the meaning of work in the welfare–to–work legislation on the lives of welfare recipients. Welfare–to–work programs need to take seriously the kind of work being espoused in recent legislation. Such an examination can contribute to a better understanding of how to create a more socially just democratic society in which all members have the opportunity to engage in good work and hence have an opportunity for a good life.

Conceptual Framework

This study is grounded in a critical theoretical orientation. Paramount to any study grounded in such a tradition is the need to (a) make visible the dominant social constructions and the interests they represent, (b) understand and analyze societal forces and practices with the goal of transforming them, and (c) empower people to free themselves from oppression and domination (Anderson, 1989). In particular, I drew from Kincheloe's (1999) critical analysis of work in a capitalist society. Kincheloe's differentiation between work and job is important in understanding the meaning of work in the welfare–to–work initiatives. He asserted "a job is simply a way of making a living; work involves a sense of completion and

fulfillment. In a job, items are produced for consumption, whereas work produces items that are put to use in people's lives. An individual's purposes and meanings are engaged in work, but they are repressed in a job" (p. 64). According to Kincheloe, *good work* means more than simply the attainment of a job. The idea of good work is particularly relevant to any discussion about the recent welfare–to–work legislation, which has adopted an uncritical use of the word work. Typically, when used in the context of this legislation, work simply means a job, even if it is a job that perpetuates a person's impoverished status.

Method

> Since 1996, welfare caseloads nationally dropped more than 30%, a remarkable decline. State agency heads, local caseworkers, and TANF recipients now realize that the business of welfare is work, not checks. (Thompson, 1998, p. 37)
>
> Oh yeah, McDonald's is hard work for low pay. I've got friends that work there, and she said you're looked at like a little cockroach. [Lilly, age 24]

The two quotes juxtaposed above exemplify a primary problem with current research about welfare–to–work. The first quote, like much of the research being published, touts the legislation as a huge success. Nationwide statistics indicate that people are moving off welfare into work. Welfare caseloads have dropped nationally 47% since January 1994 (Newman, 1999). However, Lilly's quote problematizes the success and points to the problems with relying solely on statistical data to draw conclusions about the success of any reform including welfare–to–work. To understand the social implications of welfare–to–work, one must delve into the lived realities of these numbers. This study, involving one welfare–to–work program and 13 people whose lives are impacted on a daily basis by welfare reform, provides a glimpse into realities not mentioned in statistics.

The site of this qualitative interpretive case study was one of 22 vocational schools in a midwestern state that administered a TANF program. Data for this study was collected over a nine-month period extending from Summer, 1999 through Spring, 2000. Data collection consisted of four methods: one-on-one interviews, group interviews, participant observation, and document analysis. In order to understand the meaning of good work from multiple perspectives, participants were solicited from three categories: TANF recipients involved in the program, teachers in the program, and administrators. Members from all three groups participated. However, for the purpose of this article, data gathered only from TANF participants is presented. The 13 TANF recipients interviewed for the study were representative of the larger population of TANF recipients at this site. Thus, their participation was elicited through a typical sample, defined by Merriam (1998) as reflecting "the average person" (p. 62).

Participants

All of the individuals involved in the TANF program at this site were women with children. Of 13 TANF participants, nine were white, one was Hispanic, and three were African-American. They ranged in age from 18 to 41 years. One was 18 years old, five were between the ages of 20 to 30 years, six were between the ages of 31 and 40 years, and one was 41 years old. The ages of their children ranged from three months to 17 years of age.

Interviews

Interview data were collected through semi-structured, open-ended interviews with both individuals and small groups. Over the course of the study, one formal interview was conducted with each of the 13 TANF recipients at this site. Interviews lasted from 30 minutes to two hours. Interviews were conducted on site, in the break room and available classrooms. Each interview was audio taped with the participant's permission.

In addition to one-on-one interviews, three group interviews were also conducted. The first interview was conducted with five TANF participants with the purpose of discovering obstacles that led to failure in the workplace. The second group interview was conducted with seven students and the job coordinator during one of the class periods. The topic of the interview was barriers to employment and how to overcome these barriers. The third interview was with two of the participants that had been interviewed earlier. They asked to be interviewed together. All group interviews were audio taped. Additional data was collected from informal interviews conducted with participants before classes, in the break room during lunch, at a Christmas party, and during class discussions.

Participant Observation

Observations of the TANF program began on the third day of the new orientation session. Over the next three months, observations took place three hours a day two days a week. For the following six months, observations took place one day a week for three hours. During the nine months of observation, I moved from a passive observer, sitting quietly in the orientation sessions and remediation classes to an active participant, taking part in group discussions, role playing, and group sharing of personally reflective exercises. As able, copious on-the-spot notes were taken, which were later written into extended field notes. Often, however, because of participant activity, notes had to be written at the end of each day. A separate field journal for recording personal thoughts, emerging themes, and ethical decisions was also maintained.

Document Collection

In addition to interviews and observations, data was also collected through document analysis. Documents included the *Hard Choices* curriculum, student handbooks, attendance contracts, orientation agendas, information guides, course catalogs, financial aid applications, special project applications, information specific to this TANF program, Spring break activities booklet, statistics reports, academic calendar, GED information packet, informational data about welfare-to-work, student writings, and numerous handouts given to students. A total of 63 documents were examined, analyzed, and categorized.

Data Analysis

The data analysis technique used in this study was based on Marshall and Rossman's (1995) five step procedures of analysis: (a) organize the data, (b) generate categories, themes, and patterns, (c) test the emergent hypotheses against the data, (d) search for alternative explanations of the data, and (e) write the report. I began the process of data analysis by organizing data into manageable chunks. This entailed reading the transcripts, field notes, and documents repeatedly so that an in-depth understanding of the content was gained. Interviews were then organized into two stacks: TANF participants and teachers and administrators. Field notes were kept separate, and all documents were gathered into a central box.

In developing coding categories, salient themes were identified in two ways. After reading the transcripts, field notes, and documents several times, key terms and repeated phrases were highlighted and categories were formulated in the right-hand margin. In particular, coding categories were developed based on six of Bogdan and Biklen's (1992) list of coding families: perspectives held by participants, participants' ways of thinking about people and objects, activity codes, strategy codes, and pre-assigned codes. Based on this first round of coding, 76 themes, ranging from GED testing to drugs to welfare stereotypes, were identified.

In the second step of the coding process, the 76 themes were collapsed into 23 taxonomies: bad work, good work, good workers, bonding, self-esteem, testing, TANF legislation, orientation, *Hard Choices*, description of site, drugs and abuse, expectations, past work experiences, family life, vocational classes, remediation, children, fears, DHS, prejudice, obstacles, and attitude.

In the third step of analysis, data was evaluated in terms of asking how the emergent data related to the purpose of the study and research questions. When holes were discovered, original interviews, field notes, and documents were returned reviewed for clarification, and in some cases, I returned to the site for further clarification from my participants.

In the fourth step, I had to "engage in the critical act of challenging the very

pattern that seems so apparent" (Marshall & Rossman, 1995, p. 116). This step of the process was very important for it forced me to reexamine my own biases against the recent welfare reform and analyze in a new light the perspectives of my participants.

The data in this article is presented by highlighting participants' perspectives and allowing their viewpoints to provide the framework for the report. Many direct quotes rather than summaries of their quotes are included. This is important so that readers gain an understanding of their tone and use of language rather than reading my interpretation.

Discussion of Findings

In this section, I describe and analyze the meaning of work as perceived and enacted by TANF participants themselves. In particular, their understanding of the meaning of "good work" versus "bad work" is presented.

The Meaning of Work

The 13 women involved in this study displayed varied realities concerning the meaning of work, job, and career. While some may argue that it is simply a case of personal definitions, it is important in the fact that these women are all involved in a welfare-to-work program which is manifested in a "Work First" agenda and how they define work is central to the way in which they view the opportunities for their individual lives.

For several women, work meant making money–even if the work is meaningless, low-paid, and low-skilled. For these women, work typically meant waged work which was perceived as something imposed on an individual with little personal rewards. Eveyln illustrated this point,

> Work is something that you do to get money but you are really not happy at it. You may do it to make somebody else happy. Work, it seems to me, is pushing you to do something you really don't want to do.

However, most of the women echoed the sentiments of policymakers that work (regardless of the kind of work) enhances TANF participants' self-esteem in that they know they are responsible, productive citizens. Most of the women defined work as something that would make them feel better about themselves, and thus, make them happier people:

> [Work means] supporting your family that you have not supported for so long on your own. Do it yourself and keep the job. It is something you want to do. I've never had a job. Everyone tells me that when you get that first check you will be so happy. [Sue]

> [Work means] 8 to 5 job Monday through Friday. Good job, get a paycheck,

> bills get paid and Oh, we got a little bit of money we can do something this weekend. . . I want a house, a car, and a horse. If I get all that, I will be happy although you do have to have clothes for a job. [Sally]

Although many of them thought having money earned from their job would make them happy, missing from their discussion of work was the belief that work could and should be enjoyable. In fact, Katherine was the only TANF participant who equated work with an enjoyable endeavor. This is not surprising since the majority of these women have not experienced prior work experiences as being something they liked. Katherine, however, had a positive work experience in her former job as a factory worker. She explained,

> Work is "a place to go." Work to me is a place to have fun and work at the same time. Like doing factory work, you can have fun doing that plus it's work. I love to work with my hands, if I can't work with my hands then there ain't no point in working.

This notion of enjoying one's self came up most readily in discussions about the differences between job, work, and career. Most of the women felt that a job or a career was something one could enjoy. Work was something one had to do, but it was not enjoyable. Sally explained that "a job is something that you enjoy doing. You say, 'I have a good job [as opposed to] I got to go to work today.' I had a good job as a travel agent but got fired because I got pregnant." Similarly, Evelyn stated,

> A job is something you like doing, good at it, and makes you happy. You are supposed to love your job and like what you are doing and feel good about it and the people around you.

Camille distinguished between work, job, and career in the following way:

> Work and profession are different. Profession is something you enjoy doing, something you pick for yourself. A job is where you work, and a profession is a step over a job and work. I am here looking for a profession.

A career was seen by many of these women as something one can choose as a means of attaining a future of life-long work. For example, Kippy defined career as having a skill that makes you marketable, and Sheena explained career in this way,

> Well, having work is, you know, it'll take care of you, your household, but if you don't have the kind of job that you are looking for to maintain, then you're still gonna be struggling. A job could be any job, and a career would make the difference between that job. Like you pick a career that's gonna better yourself.

All of these women expressed the desire to have jobs that required them to do more than simply flip burgers, but the message that they are given repeatedly is

"any work is better than no work." One way the TANF legislation perpetuates this belief is through Job Search, one of 13 allowable work activities available to TANF clients. Job Search requires a client to document that she has spent 30 hours a week looking for work. If offered a job, the TANF client is required to take it regardless of the type of job. If the person declines she can be denied benefits such as Medicaid, TANF checks, and food stamps. There are, as the administrator at this site explained, "loopholes." For example, a mother of school age children could put restrictions on her availability by saying that she has to be at home from 3:00 p.m. until midnight. If offered a job during this time period, she would not have to take it based on restrictions on her availability.

In many ways many TANF clients have internalized the belief that any work is better than no work. More than half the women in this study were grateful for the opportunity to engage in honest work so they could become self-sufficient, productive citizens. They believed that taking on personal responsibility for supporting their families would enhance their self-esteem. From a critical perspective, these women are operating under "false consciousness" which Marx (cited in Ritzer, 1977) argued is part of the hegemony of capitalism which dupes workers into believing they are autonomous, free-thinking individuals who deserve the work that capitalists give them. Many would argue that based on these women's perceptions of work, the welfare–to–work legislation is a successful mechanism for disciplining workers for the workplace by developing "personal demeanor, modes of self-presentation, self-image, and social-class identifications which are the crucial ingredients of job adequacy" (Bowles & Gintis, 1976, p. 131).

Welfare recipients certainly have differing opinions about the meaning of work, and in most cases, the connotation of work is a negative one. This leads one to ask if welfare–to–work might eventually be changed to welfare–to–career in much the same way as school–to–work has been changed to school–to–career. Since the major focus of the welfare–to–work legislation has been on work, these differing understandings and negative connotation present an obstacle in light of the fact that work is never defined in policy statements. Without a clear and agreed upon meaning of work and the purpose of the legislation in terms of people "going to work," how can success really be determined?

The Meaning of Good Work

Kincheloe (1999) asked, "In a democratic society . . . what constitutes good work? Socially beneficial work? Just work? Fulfilling work? Democratic work?" (p. 64). Kincheloe asserted that good work is possible in a capitalist, post-industrial society and lists 10 characteristics of good work. These characteristics include among others, the belief that good work is self-directed, is not monotonous, offers

opportunities for learning and contributing to the social welfare, incorporates the virtue of play, and pays wages that lessen the disparity between workers and managers. However, Kincheloe's research does not focus on the lives of workers themselves. Hence, one purpose of this study was to compare and contrast perceptions of the people who live good and bad work on a daily basis with Kincheloe's analysis.

One of the most important factors of good work, according to 11 of the 13 interviewed, was making a decent hourly wage. Typically, a decent wage was considered to be anywhere from eight to ten dollars an hour.

> To be financially stable without any help. I don't want help from the state or anything like that. Right now I could make it at $6.50 an hour you know and that would be tough so making $8.00 as the base pay will be pretty comfortable for me right now. [Camille]
>
> $9.00 to $10.00 an hour, which is good. You know, it is a lot more than I ever made working at McDonalds. [Evelyn]

Because these women have struggled financially for most, if not all, of their lives, the stability of a paycheck offers them one less worry in their life. Thus, good work is work that relieves stress . Sheena and Shilea explained,

> Good work means I wouldn't be worrying about if the rent's going to be paid this month. If rent's gonna be paid that month. You know, bills, stuff like that. If I had a good job where I could maintain. No worry, no stress. [Sheena]
>
> I want to be in a good working place with benefits, insurance, you know, things like that. I'd like to have a better car than what I have now. I ain't gonna say worry free, but less worry, less stress. [Shilea]

Sue astutely recognized that perhaps her definition of good work is based on her impoverished life and her lack of having any experience with good work. She said, "Maybe my knowledge will go up and I'll think something different, but now it is just money."

More important than pay, however, was that good work involved doing something enjoyable. All 13 women were unanimous is saying that good work would be something that they enjoyed doing as explained by Lilly and Candy:

> Getting the job done is important, but it is more important to be happy where you are at. That is just how I am. I don't want to be unhappy, I already did that before. [Lilly]
>
> I worked at Covergirls [a local strip club]. Most people can't make $1400 in one day, but I did, but I hated it. So, I am not there. If I liked it, I would still be there, but I hated it. I've got to like what I'm doing to be happy. [Candy]
>
> Part of enjoying what one does is having a healthy work environment, and

several of the women pointed out that good work meant having an environment in which co-workers and bosses were likeable and the atmosphere at work was non-stressful.

> Good work means friendly people where everyone gets along good. It is comfortable and relaxed. Dress comfortable and everybody just gets along with each other. [Katherine]
>
> Good work would be a small dental office, very nice boss, and the other employees nice and easy to get along with and short hours. [Candy]
>
> I would not want to work around anyone that was rude, or had apprehension about trying to train me because they feel like they are top dog and they don't have time for you. I would like to work in a fun atmosphere, kind of laid back. [Kippy]

In many ways good work was connected to their responsibilities as mothers; yet, unlike middle-class women who might see good work as work that allowed them flexible hours and flexible work sites so they can spend time with their children, good work for these women meant being able to provide for and support their family. It must be remembered that all of these women are the primary care givers for their children; most of them are single mothers, so the immediate need of taking care of their children financially seemed to take precedent over time spent with children.

> I want to be able to work and make the money, you know, to be able to get my kids what they need or want, some things they want, but not everything. [Katherine]
>
> I need something that can support me and my three kids and if that is nine months of school here to get me a good job when I get out, fine. I bite my tongue, and find the strength to do what I've got to do. [Sue]

Candy, who is married, was the only one who stated that a key feature of good work to her was having some time off (e.g., Wednesday and Friday afternoons) so that she could spend time with her son.

For about half the women, good work meant having benefits. Here, benefits related solely to medical insurance. Not one of the women mentioned retirement benefits, paid vacations, life insurance, or any other commonly thought about components of job benefits. Since several women suffered from various health problems, medical insurance was a number one priority. Evelyn, who has Chrones' disease, was very vocal in her having to have benefits for a good job:

> I will not take a job if there are no benefits. I don't care if it pays the highest salary in the world, if it does not have medical….I don't care about paid vacations or any of that. It could pay $1000 a day but if it does not have medical, I am not taking it. If something happened to my children, where

> would I be. If they did not have workers comp, I would not take it. My health and my children's health are more important than the highest paid salary because without that, the job is just not worth it.

Good work also meant having some kind of skill that would make one marketable, thus leading to stable work. Having a skill meant that if fired, she could get another job because she had a skill that was needed in the workplace.

> I want a skill, something to make me feel proud of myself like I know a little more than most. [Kippy]
>
> I want to do something, something good, something meaningful. I don't want to work at McDonalds or Wal-Mart. I want to have a job that I have skills in that I can go and find another job if I lose that job. Where I can make money to support myself and my children. [Lizze]

Interestingly, Janice, who desired to be a drug counselor, was the only woman who felt that having a college degree was imperative for good work.

> I would hope to be sitting in my own office with my degree up on the wall for counseling and have made it through this school and to get my counseling degree will definitely be more school. At least 4 more years.

Sally felt that having some marketable skills meant the difference between having a "pity job" (which someone just give you to help you out) and a job where employees were in a more reciprocal relationship with their employer.

> Just give me something to do. You got those files, then I will do it. You want these phone calls made, I can do that. Just make sure that I have something to do. Make sure that you are not just giving me this just to give me something, that I am doing something that will help you.

A few of these women felt that the particular skill that was needed in order to get good work was technological skill. For example, Sheena felt that having the word technology in her job title would enhance people's perceptions of her. She stated, "I like it because of the title, technology. It'll make me feel important, technology. What do you do? I work in technology." Similarly, Janice believed that computer literacy was imperative for good work.

> I don't know of any job from flipping hamburgers to attorney's office that they do not use computers and with any field I choose to go into, which I want to get my counseling degree, you need to know about computers.

She goes on to talk about how being computer illiterate put her at a disadvantage in her previous job situation. She believed that having computer skills would enhance her self-confidence:

> When my life started going downhill was when computers were first coming out into the work field and that is kind of when I walked away from work,

> from a job. Any kind of job, work, it is hard, you know , without computers. So, I am just trying to get the basics, just understand the computer and get as much education in computering as I can.

A few equated good work as having some kind of power or authority. Lizze explained that she wanted to be a juvenile probation officer because of the power, "I want to tell them, you got to do this. Some people, it would make me feel good. Kind of like DHS. They have the power." Similarly, Evelyn asserted,

> I want my own office by myself in a nice setting and nice salary. Not like a secretary, like a business manager. Not at like McDonalds, any kind of company like a travel agency, having that authority, I don't know…more like an assistant manager.

Sally reflected an understanding of good work that seems typified in such movies as "Baby Boom" and "Working Girl" in which the woman executive wears the power suit and has some authority while still retaining her good looks. "A good job would be to put my hair up…with my business suit. Be one person at work then get off and be another."

Most of these women, in talking about their prior work experience, stated that they had never actually experienced good work as described above. Only Sherry talked about a personal work experience that she felt was an example of good work. This was her experience working in a factory in which she experienced several components of what others have talked about being good work: decent pay, personal satisfaction, and the respect of co-workers. She explained,

> If the machine didn't tear up as much as it did, I would have probably could have done it for years and years with the money going up. So, if the money kept going up and up and up, and my health wasn't bad, I would have been still there. I put my headphones on, nobody bothered me, I was to myself all day, and do my job, and that was it. They liked me, they respected me very well, because nobody else wanted to do the job, and I was the fastest one at doing the job. I felt good at doing the job.

Bad Work

Throughout the study—in interviews, field observations, and focus groups—work at McDonald's or "flipping burgers" was used as a metaphor for bad work. This is interesting in light of the fact that service sector jobs, like at McDonald's, are the fastest growing segment of employment in this country (Apple, 1998). Yet, women in this study did not view McDonald's type of work as desirable. They felt it epitomized bad work because it was low-pay, low-skill, and menial:

> I want to do something, something good, something meaningful. I don't want to work at McDonalds or Wal-Mart. [Lizze]

> I would be bitter too, if I worked at McDonalds. [Candy]
>
> I am grateful for this opportunity. This has given me the time to get my life back on track. If I went to work, I just, I mean anybody can go to McDonald's and flip hamburgers. That is not what I want for myself and my daughter. [Jancie]
>
> I don't like McDonalds and all them people. You don't get paid that much to put up with all that crap. It's hard work for low pay. I've got friends that work there, and she said you're looked at like a little cockroach. [Lizze]
>
> Bad work would be some type of hard labor or McDonalds or a Burger King. I would feel like I wasted my time if I got a job like that. I wouldn't belong there. I like to have some people contact, but I don't like to feel like I am waiting on them. [Evelyn]

Not surprisingly, responses about bad work were often centered on issues of low pay. For example, Katherine stated, "I need to make $5.00 or $6.00 an hour. They still give minimum wage for low paying jobs. I can't live on, say, $3.00 an hour. I can't live on that. I can't raise any kids on that, there just ain't no way." Similarly, Lizze asserted, "I thought I would be able to make it on my own, but $5.50 is not anything with kids."

However, a hostile work environment was cited more often than low pay as being indicative of bad work. Unfair bosses, petty co-workers, unhealthy work, and long hours were all factors that lead to a job being categorized as bad work.

> Bad work is bad pay, bad boss that is mean to you, long hours [weekends or nights], other people at work are hard to get along with. Just something where you dread getting up and going. [Candy]
>
> Bad work is working with people that don't like you. I don't know what kind of job. I don't think there is a bad job. If you need a job you are going to take it. [Sue]
>
> Get $5.50 an hour, everybody fights and talks behind everybody's back and no one gets along and someone is stealing in the office. I would consider that bad work. [Lizze]

Many of these women had resigned themselves to the fact that bad work was an inevitable part of their life as explained by Shilea, who talked about the job she currently has as being bad work but as essential to her livelihood and something about which she has little choice.

> I've done too much of that [bad work]. Like right now, I'm making too much of bad work, but it's helping pay my bills. Rent and stuff, and it's taking care of the babies. I work at a janitorial service. I go at night and I clean this building. I clean the outer side. Somebody cleans the inside, and if they're not

there, I do their part.

Although many supported of the welfare–to–work legislation might argue that bad work eventually leads to good work if the individual is motivated and hard working, these women did not express the belief that bad work can lead to good work. This was probably due to the fact that in their own experiences working at various jobs they never moved into good work. Rather, more often than not, they lost their jobs long before they could prove they had the right stuff to deserve the chance to experience good work. Sue, for example, was working in a travel agency, which she liked. However, when she became pregnant she was fired. Later, she was hired at a tanning salon but soon lost her job when her child became ill. Although Tracy, the job coordinator for the LOW program, contends that "we are all captains of our own ships," most of these women do not feel so optimistic. As Sue poignantly commented, "I don't think there's a bad job. If you need a job, you are going to take it." Obviously, the luxury to choose a job based on whether it is good or bad work is not one that many TANF clients have.

Conclusions

The purpose of this study was to define the meaning of good work from the perspectives of TANF clients. Kincheloe (1999) speaks of the need for such definitions, "If schools and workplaces are to contribute to the reinvention of democracy and challenge the antidemocratic tendencies of the contemporary era, good work must be carefully defined and pursued" (p. 65). According to women in this study, good work includes the following five characteristics:

1. Self-sufficiency and a decent wage
2. Intrinsic value
3. A healthy work environment and workmate cooperation
4. The ability to care for one's children
5. Benefits

As articulated by TANF participants, good work must include the principle of being able to live life without financially struggling. All participants agreed that good work meant decent pay. Kincheloe (1999), in his 10 characteristics of good work, placed "better pay for workers" as his tenth characteristic. He noted, "Obviously good work cannot tolerate the obscene differences between management and worker pay" (p. 69). He then discussed corporate profits and managerial slashing of labor costs. No other mention is made of the basic premise that good work means good pay. For women in this study, living day-to-day without knowing if rent can be paid or clothes for their children can be bought is part of their lived reality. Thus, they are in search of jobs with decent wage.

A second principle articulated by study participants is that good work must be personally satisfying. TANF clients spoke of such things as being happy with what

they were doing and being good at what they do. Kincheloe (1999) did not talk directly about good work as being work that is personally satisfying, but he did allude to an element of enjoyment and happiness in several of his characteristics of good work. For example, he noted that good work should incorporate elements of play. However, his notion of play centers on freedom and fairness rather than play as something that is enjoyed and makes one happy. He also noted that good work should allow for expression of self. He particularly talked about good work as involving creativity, but he goes on to say that "a critical definition of output would not be complete until it included concerns with the intrinsic satisfaction of work, the economic security of workers, and the role of work in the workers' pursuit of happiness" (p. 67). Clearly, the participants in this study believe that at the heart of good work is that it fulfills their intrinsic needs as well as extrinsic needs.

A third principle of good work is that good work means being involved in a healthy work environment where people work with each other rather than against each other. Kincheloe (1999) agreed that one characteristic of good work is that of workmate cooperation. Whereas Kincehloe saw this as a group of workers putting aside their own needs and engaging in the intellectual process of "sit[ting] down together, exchange[ing] information, and discuss[ing] the nature and purpose of their work" (p. 66), women in this study view a healthy work environment as one in which people are comfortable with one another.

A fourth consideration is that good work is integrally connected to being able to care for both the physical and emotional needs of one's children. Unlike Dr. Laura and others who view good work as taking care of one's children at home, participants did not talk about good work in terms of actual time spent with their children. Rather, they spoke of good work as giving them power to care for their children in terms of basic needs such as clothing, medical care, health benefits, and a few luxuries (e.g., a bike). Deprez (1998) articulated this contradiction.

> It seems particularly odd to me that at the same time welfare for poor women and their children is getting the old heave-ho, right-wing papers such as the *Wall Street Journal* are on a crusade to encourage middle class women to stay home and take care of their kids because it is good for the children to have a mother at home for the first few years. And also because it is a "natural instinct" for women to care deeply about their children. Well, I guess they think poor kids and poor women are exempt from these realities. Perhaps they think it is perfectly okay for poor children to come home to an empty house, but rich kids and nannies are in danger. (p. 26)

Kincheloe (1999) made no mention of the connection of good work and children. However, for these women, the primary providers for their children, good work is tied to their children, albeit in different ways than the middle class.

The last characteristic of good work is having benefits, particularly medical insurance. Many of the women in this study suffer from poor health. Thus, they recognize the importance of being able to care for their own and their children's immediate health needs. Again, Kincheloe (1999) makes no mention of good work being tied to access to benefits. Since these women are the primary care givers for themselves and their children, taking care of the physical needs of their family is paramount to considerations of good work.

Most of the characteristics of good work espoused by Kincheloe (1999) were missing in TANF recipients' and their teachers' and administrators' understandings about the meaning of good work. Kincheloe asserted that good work means being one's own boss or being free from the "tyranny of authoritative power" (p. 67). None of the participants expressed a notion of good work as being free from the "humiliation of supervision that holds them under suspicion and surveillance" (p. 65), although three women did note that good work meant having some power and authority. Typically, however, this power was conceptualized not as being the boss per se but as being the bosses' secretary. One might propose that because TANF clients are so indoctrinated into the idea of being a good worker (i.e., taking orders from someone else) that they cannot imagine themselves as people with power.

Also absent from their discussion of good work is the idea that the workplace is a place of learning and that good work should contribute to the public good. One could certainly argue that Kincehloe's (1999) explanation of contributing to the social good is very much reflective of a white liberal position in which one has the luxury to think about work in terms of such questions as "Do the goods being produced serve human needs?" and "Do they [goods produced] meet the criteria of permanence, healthiness, and artistic and creative integrity" (pp. 66-67). The TANF women I studied have struggled their entire lives to satisfy the most basic needs of food, shelter, and clothing, and do not view good work as serving the more abstract principle of service to the common good.

Kincheloe (1999) talked about bad work in terms of esoteric ideological assumptions that include such principles as bad work as "the supremacy of systems-efficiency and cost-benefits analysis models, or the effectiveness of standardized inputs in the quest for agreed-upon outputs" (p. 71). Women in this study responded much more concretely when explaining their perceptions of bad work. Bad work was the opposite of all the characteristics of good work. To put it succinctly, working at McDonalds epitomizes bad work. Bad work is low skilled, low level, low paying, and unsatisfying work in an unhealthy, stressful, contentious environment. Unfortunately, as much of the research on welfare reform is telling us, McDonald-type jobs (i.e., low paid, low skilled) are the most prevalent kinds of work welfare recipients are finding.

Implications for Vocational and Adult Education

Under the new legislation, education and training for welfare recipients consists primarily of short-term training programs and brief on the job training sessions (Hayes, 1999). Hence, education becomes a secondary consideration. The focus for preparing people for work in a short time has now fallen to vocational technical schools and adult education centers; thus, adult and vocational educators must take a lead in implementing educational programs that promote "good work." This involves working diligently with policy makers to ensure more time for TANF recipients to spend gaining the education they need for good work.

Additionally, adult and vocational educators involved in TANF educational programs must challenge the banking model of education by formulating curriculum and practices that encourage students to be reflective thinkers, critical and ethical decision makers, and community builders. This will entail, in many instances, changing pedagogical approaches. Grubb (1996) indicates that there are two dominant pedagogical approaches in teaching workplace literacy. The most common approach is a teacher-centered, teacher-directed approach. This approach has a long-standing tradition in U.S. education. Certainly, when workers were organized around Frederick Taylor's theory of scientific management, this type of didactic instruction might be rationalized as an appropriate way of inducting students into a culture of work. However, as Grubb pointed out, worksites are slowing changing, and with the influx of "Work First" workers coming into the workplace, a different way of teaching needs to be employed. The second way of teaching workplace literacy seeks to accommodate the changing worksite by offering instruction based on a student-centered, constructivist model of pedagogy. Yet, constructivism void of the purpose of social change is limiting. Adult and vocational educators involved in TANF programs must take seriously Dewey's (1916) assertion that "it is the aim of progressive education to take part in correcting unfair privilege and unfair deprivation, not to perpetuate them" (p. 13). The challenge then for adult and vocational educators is to assist TANF recipients in attaining not only the technical skills needed for good work but also the critical skills needed to participate in a true democratic citizenship. Adult and vocational educators face many challenges in trying to integrate critical literacy with the skills needed to perform a particular job. Curriculum planners for TANF programs must be able to demonstrate how the teach of liberatory skills will benefit employers in ways in which they can understand, such as lower absenteeism, higher morale, and increased productivity.

Public dialogue is essential if we are going to be a country that believes all must and should engage in good work rather than simply work. Such dialogue, however, must include TANF recipients themselves. Research such as that cited in this study adds to this dialogue by not only including the voices of TANF

recipients who have much to say about welfare–to–work, but also problematizing the meaning of work so that discussions surrounding welfare reform might shift from welfare–to–work to welfare–to–good work.

References

Abramovitz, M. (1996). *Regulating the lives of women*. Cambridge, MA: South End Press.

Abramovitz, M. (2000). *Under attack, fighting back: Women and welfare in the United States.* New York: Monthly Review Press.

Albelda, R. (1999). What welfare reform has wrought? *Dollars & Sense, 221,* 15-17.

Anderson, G. (1989). Critical ethnography in education: Origins, current status, and new directions. *Review of Educational Research, 59,* 249-270.

Apple, M. W. (1998). Teaching and technology: The hidden effects of computers on teachers and students. In M. Apple & D. Noble (Ed.), *The curriculum: Problems, politics, and possibilities* (pp. 314-336). Albany: State University of New York Press.

Agron, J., & Kennedy, M. (1999). *Bridging the digital divide.* American School and University.

Bogdan, R., & Biklen, S. (1992). *Qualitative research for education.* Boston: Allyn and Bacon.

Bowles, S., & Gintis, H. (1976). *Schooling in capitalist America.* New York: Basic Books.

Cohen, A. (1998, July 13). Dressed for success. *Time* (2), 38-39.

Dewey, J. (1916). *Democracy in education.* New York: The Free Press.

Deprez, L. (1998). Classist conceptions of dependency and conservative attacks on poor women with children. In K. Rhoades & A. Statham (Eds.), *Speaking out: Women, poverty, and public policy* (pp. 23-34). Madison: University of Wisconsin System Women's Studies Librarian.

Freedman, S., Mitchell, M., & Navarro, D. (1999, July). *The Los Angeles work first GAIN evaluation: First-year findings on participation patterns and impacts.* MDRC.

Freire, P. (1973). *Pedagogy of the oppressed.* New York: Herder & Herder.

Gregson, J. (1994). From critical theory to critical practice: Transformative vocational classrooms. In R. Lakes (Ed.), *Critical education for work* (pp. 161-180). Norwood, NJ: Ablex.

Hayes, E. (1999). Policy issues that drive the transformation of adult literacy. In L. Martin & J. Fisher (Eds.), *The welfare–to–work challenge for adult literacy educators: New directions for adult and continuing education.* San Francisco: Jossey-Bass.

Kincheloe, J. (1999). *How do we tell the workers: The socioeconomic foundations of work and vocational education.* Boulder, CO: Westview.

Lakes, R. (1994). From critical theory to critical practice: Transformative vocational classrooms. In R. Lakes (Ed.), *Critical education for work* (pp. 161-180). Norwood, NJ: Ablex.

MDRC. (2001). *Is work enough: The experiences of current and former welfare mothers who work.*

Marshall, C., & Rossman, G. (1995). *Designing qualitative research.* Thousands Oaks, CA: Sage.

McCallum, H. (1998). The ideological foundations of the TANF welfare rules. In K. Rhoades & A. Statham (Ed.), *Speaking out: Women, poverty, and public policy* (pp. 45-56). Proceedings of the 23rd Women's Studies Conference. Madison: University of Wisconsin System Women's Studies Librarian.

Merriam, S. (1998). *Qualitative research and case study applications in education.* San Francisco: Jossey-Bass.

Newman, K. (1999). *No shame in my game: The working poor in the inner city.* New York: Russell Sage Foundation.

Ritzer, G. (1977). *Working: Conflict and change.* Englewood Cliffs, NJ: Prentice-Hall.

Schultz, K. (1997). Discourses of workplace education: A challenge to the new orthodoxy. In G. Hull (Ed.), *Changing work, changing workers: Critical perspectives on language, literacy, and skills* (pp. 43-83). Albany, NY: SUNY Press.

Thompson, T. (1998, September 21). Don't punish success. *USA Today*, p.22.

Acknowledgement

I would like to acknowledge Dr. James A. Gregson for all of his support and help in preparing this publication.

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Journal of Vocational Education Research, 27(2), pp. 217-242.

The Role of Key Qualifications in the Transition from Vocational Education to Work

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Abstract

This study presents a new definition of key qualifications related to occupations based on an extensive literature search. The empirical aspect of this study describes a Delphi study focused on policy where a number of key qualifications were operationalized for three selected jobs: commercial employee at a bank, claims assessor or acceptor at an insurance company, and service mechanic. Definitions were subsequently commented on by experts from education and work in the Netherlands. Key qualifications appear to be important to enable employees who have recently started work to perform efficiently. Although, as Dutch experts believe, vocational education may play an important role in the acquisition of key qualifications, a process of lifelong learning during an employee's career is necessary to develop these further. Nontraditional instructional methods, such as project education and problem-directed education, as well as practical learning and confrontation with key problems of an occupation are especially suitable for the acquisition of key qualifications in vocational education.

Employees are being confronted in their work with constant change in the field of technology, the structure of organizations, the organization of work, and personnel management. Employers are often unable to indicate what qualifications employees will need to have in the future. There is an increasing risk that problems concerning the interface between education and work will continue to grow. As a result, there is a growing consensus about the necessity for students to acquire key qualifications in broad, initial vocational education (Carnevale, 1991; Carnevale, Gainer, & Melzer, 1990; Nijhof & Streumer, 1994a, 1994b, 1998; SCANS, 1991, 1992). The thinking behind this is that key qualifications enable new employees to respond flexibly and effectively to changes in their work, organization, occupation, and career (van Zolingen, 1995). Vocational education, according to this reasoning, will acquire the role of providing broad, initial vocational education with greater emphasis on the transfer of broad expertise and the acquisition of those skills that are necessary to be able to work competently in a particular occupation (Blokhuis, Coeck, Vermeesch, & Vilters, 1999). The problem is, however, that opinions are sharply divided as to what key qualifications are, how they can be translated into national attainment targets,[1]

and how and where they can best be acquired (Kearns, 2001). Scarcely any empirical research has been conducted into this problem. This study examined the above questions and provides answers by means of a literature search, interviews with employees who have recently started work, and a Delphi study on policy conducted with experts from the world of education and work in the Netherlands.

Changes in the System of Work and the Need for Key Qualifications

Fiercer competition, as result of globalization, causes economic and commercial change, such as changing marketplaces, higher quality requirements, and customization. These changes lead to the use of new production technology, automation, restructuring of companies, new personnel strategies and more attention for performance (Appelbaum & Batt, 1994; Den Boer & Hövels, 1999; Schumann, Baetghe-Kinsky, Kuhlmann, Kurz, & Neumann, 1994; Thompson & Warhurst, 1998; Zuboff, 1988).

As a result of all the above-mentioned changes, industry needs flexible, broadly-skilled employees who are highly skilled, can work in a less structured environment, and who are able to respond rapidly and effectively, by means of a process of lifelong learning, to the changes that are occurring in their work, organization and career (Van Zolingen, 1995). These employees are expected to possess excellent social and communicative skills, a customer-friendly attitude, commercial acumen and outstanding sales skills. They must be able to adopt an assertive attitude when necessary, and also be able to work with information and with computers. They are further required to work more independently, to solve complex problems, to exercise their initiative, to reach decisions quickly, and to be able to plan their own work (Winslow & Bramer, 1994). Furthermore, they must possess an awareness of quality, be able to think creatively and be sufficiently motivated to participate actively in the improvement of production processes. Loyalty and dedication play an important role in this. Unlike previous times, most employees nowadays are expected to be able and willing to continue to learn so that they can carry on working competently in their occupation (Delors, 1996; Faure et al., 1972; OECD, 1996). These qualifications are also referred to by the term *key qualifications*.

Key Qualifications in the USA

Above mentioned changes in the system of work have also been experienced in the USA. In the late 1980s the U.S. Department of Labor (DOL) became concerned at the impact of new technologies and major changes in the economy on the demand from employers for key skills, in particular workplace basics. The department realized that today's high-skill job market requires advanced academic knowledge and workplace skills and training, yet young entrants to the work force are not meeting these criteria. This led the DOL to commission two major studies:

a study of changes in the workplace undertaken by the Hudson Institute, and a study of the essential generic skills required by employers undertaken by the American Society for Training and Development (ASTD). The ASTD/DOL study of work place basics was a major empirical study undertaken by a team of ten over 30 months which led to three publications; the ASTD/DOL report of 1988, a book authored by Carnevale et al. (1990), and a book by Carnevale (1991) on America and the new economy. In the Carnevale's book 16 job skills within seven dimensions were identified for the contemporary workforce:

1. Learning to learn including foundation skills;
2. Academic basics including reading skills, writing skills, and computational skills;
3. Communication including speaking skills, listening skills;
4. Adaptability including problem-solving and creativity skills;
5. Personal development including self-esteem skills, motivation, and personal and career development skills;
6. Group effectiveness including interpersonal skills, negotiation skills, and teamwork skills; and,
7. Influencing skills including organizational effectiveness skills and leadership skills.

In 1991 the Secretary's Commission on Achieving Necessary Skills, the SCANS, commission was established. They developed a framework of key qualifications that was built upon the results of the ASTD/DOL study (SCANS, 1992). According to the SCANS commission workplace know-how is made up of five competencies and a three-part foundation of skills and personal qualities that are needed for solid job performance:

Workplace Competencies.

Effective workers can productively use:

1. Resources—knowing how to allocate time, money, materials, space, and staff.
2. Interpersonal skills—can work in teams, teach others, serve customers, lead, negotiate, and work well with people from culturally diverse backgrounds.
3. Information—can acquire and evaluate data, organize and maintain files, interpret and communicate, and use computers to process information.
4. Systems—understand social, organizational, and technological systems; they can monitor and correct performance; and they can design or improve systems.
5. Technology—can select equipment and tools, apply technology to specific tasks, and maintain and troubleshoot equipment.

Foundation Skills

Competent workers in the high-performance workplace need:

1. Basic skills—-reading, writing, arithmetic, speaking, and listening.
2. Thinking skills—the ability to learn, to reason, to think creatively, to make decisions, and to solve problems.
3. Personal qualities—individual responsibility, self-management and self-esteem, sociability, and integrity.

Recently, the U.S. Department of Labor and the U.S. Department of Education (2000) documented workplace skills and behaviors that have been identified by SCANS in more detail and developed a taxonomy. Levels of performance were distinguished, a comparison with the Occupational Information Network was made, and assessment tools were made available to measure the SCANS skills areas.

Key Qualifications in Europe

The economist Dieter Mertens introduced the term *Schlüsselqualifikationen*' [key qualifications] in Germany in a pioneering article in 1974. He suggested that by devoting more time to key qualifications and less time to the acquisition of specific knowledge in vocational education curricula, problems concerning the interface of education and work could be reduced. This was because key qualifications would, first, increase employees' mobility (e.g., when entering the labor market or changing jobs) and second, because employees would be better able to respond to future developments that are not entirely predictable (e.g., when changes occur within jobs).

Mertens (1974) distinguished four types of key qualifications:

1. *Basisqualificationen* [basic qualifications], cognitive qualifications of a higher order with a vertical transfer value in accordance with specific requirements from the particular occupation or from society (e.g., logical, analytical, structured, associative and contextual thinking; critical thinking using argumentation and discussion; cooperative behavior by mastering certain social rules and techniques).

2. *Horizontqualifikationen* [horizon-broadening qualifications], e.g., being familiar with information, consisting of knowledge about what information is, and being able to gather, understand and process information.

3. *Breitenelemente* [broad elements], qualifications that cover a wide field and occur in broad occupational groups (e.g., knowledge of technology and knowledge of the *ARBO* [Working Conditions] Act).

4. *Vintagefaktoren*[age factors], which remove intergenerational educational differences (for instance, programming techniques) through adult education.

What key qualifications appear to have in common is that they become obsolete (unusable) less rapidly because they are more abstract, can be used in different jobs, and have transfer value. Key qualifications increase both the mobility and adaptability of employees. Employee adaptability increases because of a better ability to cope with unexpected problems or changes. Furthermore, employees who have key qualifications would be better able to evaluate their own work and, if necessary, exercise their initiative in order to improve it. In brief, key qualifications should make it possible for vocational education to train flexible, broadly-skilled employees, who can respond rapidly and effectively to changes in their work and on the labor market.

Since Mertens (1974) introduced the term key qualifications, it has been formulated in various ways, under various names, and with various meanings, including extra-functional qualifications (Hurrelmann, 1975), socio-normative qualifications (van Hoof & Dronkers, 1980), *berufsübergreifende Qualifikationen* [occupation exceeding qualifications] (Laur-Ernst, 1983), basic skills (Nijhof & Remmers, 1989) and widely-applicable occupational qualifications (De Jong, Moerkamp, Onstenk, & Babeliowski, 1990). There has been a great deal of criticism of the term key qualifications (Elbers, Heckenauer, Mönikes, Pornschlegel, & Tillman, 1975; Geißler, 1990; Reetz, 1989; Zabeck, 1989). The critics asserted that (Mertens') key qualifications, independent of work situations or occupations, were too vaguely formulated, and it proved to be impossible to translate key qualifications into curricula.

A New Definition of Key Qualifications in the Netherlands

van Zolingen (1995) has given a new interpretation to the term key qualifications on the basis of a literature search. This new interpretation of key qualifications is characterized by six dimensions (see Table 1).

van Zolingen (1995) speaks of key qualifications to emphasize their broad applicability within an occupation. This refers to their applicability in new situations (different jobs), the accessing of specific knowledge and of new knowledge, partly through increased opportunities for communication during an employee's entire career. There is, thus, talk of a horizontal component (of place); broad applicability, and of a vertical component (of time); acquisition, development and application during an employee's entire career. Key qualifications involve having the credentials necessary to practice an occupation. It is essential that key qualifications are acquired within the framework of an occupation (during initial training, during and outside work) and are further developed according to occupational content. One major advantage of the contextual acquisition of key qualifications is that, given the right learning conditions, the problem of transfer is reduced. The updated key qualifications can be distinguished from Mertens' (1974)

TABLE 1
An updated definition of key qualifications (van Zolingen, 1995)

Definition: Key qualifications are the knowledge, insight, skills and attitudes that are part of the permanent core of an occupation or a group of related jobs with the possibility of transfer to other, new jobs within that occupation, and of innovations within that occupation, which contribute to the development of an employee's competence and facilitate transitions within his career.
General-instrumental dimension: • occupational knowledge and skills that have fundamental or permanent character and that can be applied in many situations (including basic skills such as arithmetic, language and reading, general technical knowledge, general knowledge of languages, general knowledge of computing, the ability to handle information,* ability to plan work,* quality awareness,* commercial insight*) • interdisciplinary knowledge* *Cognitive dimension*: • thinking and acting (identifying and solving problems,* abstract thinking,* methodical thinking,* intellectual flexibility, learning to learn, tacit skills, such as familiarity with material*) *Personality dimension*: • individual behavior (self-reliance,* sense of responsibility,* accuracy,* self-confidence, decisiveness,* exercising initiative,* coping with stress,* creativity,* imagination, willingness to achieve, perseverance, modern citizenship) *Socio-communicative dimension*: • communicating (ability to express oneself orally,* ability to express oneself in writing,* knowledge of modern languages*) and the ability to work together with colleagues, supervisors, and clients (social skills,* solidarity, and empathy) *Socio-normative dimension*: • ability to adapt to the corporate culture (loyalty, identification, dedication, complying with safety measures,* willingness to take part in further learning,* presentability,* knowledge of the organization*) *Strategic dimension*: • emancipatory behavior: showing a critical attitude to work and one's own interests* (dealing critically with choices in the technical field and the effects they have; taking an active part in decision-making and promotion of interests).

Note. Key qualifications indicated with an * have been included in my own empirical research. The others have been taken from literature relating to this topic.

key qualifications, on the one hand, because they are not restricted to the cognitive dimension, but also include the socio-communicative, personality, socio-normative, and strategic dimensions. On the other hand, the updated key qualifications are formulated by occupation. This also distinguishes the updated key qualifications from workplace know-how described by SCANS (1992). Furthermore, the updated key qualifications are somewhat more geared to current developments in trade and industry, which needs assertive employees who work with great dedication, have an eye to improvements in production processes, and possess excellent social and communicative skills.

Key Qualifications Studied

Procedure

I am currently interested in which key qualifications will be important in the future, how key qualifications can be *specified*, if they can be *learned in secondary vocational education*, and *how* that can best be done. To answer these questions, I studied the opinions and arguments of representatives of various groupings in education, work, and government. What was important was to obtain the opinions of various parties who are dealing with this issue, and to clarify underlying arguments. This would allow various policy alternatives to emerge. With the above in mind, I decided to carry out a *Delphi* approach (Linstone & Turoff, 1975). A Delphi study on policy consists of a heterogeneous group of experts, who during several rounds are consulted in writing and possibly are also interviewed about a particular problem in order to produce various arguments for their opinions, which may well differ, with the aim of generating policy alternatives. After an exploratory study of the literature relating to the interface between education and work, it emerged that in relation to *MBO,*[1] the MEAO-C(ommerce)[2] and MTS-E(lectronics)[3] specializations in particular might well be interesting cases for the study of key qualifications, because the workfields of both specializations keep changing fast as result of continuing automation, introduction of new technologies, customization and restructuring of organizations.

The MEAO-C specialization was restricted to banking and insurance. This was decided because it was not feasible to include the entire field of activity of MEAO-C school-leavers. In addition, the banking and insurance industry has been facing enormous changes in recent years as a result of automation, growing competition, and a changing organizational structure (Tijdens, 1989; Tolner, Sluijs & Dankbaar, 1993). *The MTS-E specialization* was restricted to the position of service mechanic in the industrial sector. It was not feasible to involve all MTS-E school-leavers in the study. Second, the impact of the introduction of new technology is very great, particularly in the field of electronics (Hövels & Vink, 1991; Peters, Nijhof & Streumer 1991). Third, recent research by Hövels & Van

Dijk (1989) revealed that half of MTS-E school-leavers find work in the service sector.

Structure of the Study

I initially thought that the most important key qualifications could be selected and described (for MEAO-C and MTS-E school-leavers, respectively) on the basis of the literature, and that these could then be submitted to panels of experts.[4] However, both the literature and an exploratory interview round with 18 experts from educational practice and fields of activity (first pilot study, see Figure 1)[5] made it clear that it would not be possible to follow this route. It did, however, prove possible to select 25 key qualifications for the Delphi study (see key qualifications with * in Table 1). The criterion selected was that these key qualifications were considered important for MBO school-leavers who had recently started work. Key qualifications could, however, not be described for the selected specializations, since I realized that the MBO school-leavers from MEAO-C and MTS-E were working in very different jobs. This fact made it difficult to provide an unambiguous definition of the most important key qualifications for each of the two MEAO-C and MTS-E specializations. This problem had been pointed out previously by De Jong et al. (1990). For this reason I decided to restrict the study to four initial jobs that were relevant to school-leavers from MTS-E and MEAO-C education: service mechanic, commercial bank employee, claims assessor, and acceptor at an insurance company.

A second pilot study was introduced, consisting of 18 interviews with school-leavers from MBO working in one of the four above-mentioned initial jobs, so as to achieve a definition of the selected key qualifications[6] (see Figure 1). During these interviews various task areas were distinguished within the selected jobs. For each task area interviewees were asked if they had called on one or more of the selected key qualifications and, when this was the case, school-leavers were asked to define this as clearly as possible in their own words.[7]

The key qualifications for employees who had recently started their careers were then described with the aid of these data. These key qualifications described by school-leavers formed the starting point for the two subsequent Delphi rounds. This resulted in two sets of descriptions on which experts agreed: The first being a description of the key qualifications which MTS-E school-leavers who had recently started work had to have; and, the second a description of the key qualifications which MEAO-C school-leavers who had recently started work needed to possess.

In the first Delphi round a questionnaire was sent to 53 experts from the world of education and work[8] (see Figure 1). After the questionnaire had been submitted and processed, a one-day work conference was held. Results of the questionnaire formed the basis for discussion between experts from the field of education and

work. Fifteen experts (per sector) from the questionnaire round who had answered the questionnaire comprehensively and who appeared to be enthusiastic and had considerable knowledge were asked to take part in the second Delphi round to exchange opinions about the questions asked and substantiate them with arguments. Ten experts took part in the industry work conference. Nine experts took part in the banking and insurance world work conference. At the end of the study a short questionnaire based on results of the work conference was sent to all panel members. The object was to reach a definition to which everyone could agree of the most important selected key qualifications of MTS-E school-leavers and MEAO-C school-leavers who had recently started work.

Results

The Term "Key Qualifications"

For a further profile of what key qualifications are, it is important to draw attention to the following aspects. What clearly emerges from the study is that one characteristic of key qualifications is that they form a whole. When, for instance, a service mechanic repairs a fault, he has to use various key qualifications, such as methodical thinking, problem solving, the ability to handle information, social skills, commercial insight and quality awareness, which are used in correlation to achieve the main objective (keeping the customer satisfied) rapidly and efficiently. In other words, their integrated nature is characteristic of key qualifications.

Second, it has proved necessary to formulate key qualifications within the context of an occupation, since the same key qualification is interpreted differently in different occupations (De Jong et al. 1990). A service mechanic's commercial sense may be limited specifically to cost consciousness. A commercial employee working in a bank, however, is expected in this context to possess a *sales mentality*. In other words, key qualifications are occupation-linked. The acquisition of key qualifications takes place in the context of learning an occupation. It is a process of lifelong learning, the basis of which is laid down in the family and is continued within the framework of a specific occupation in MBO and during the employee's further career both in and outside work. Key qualifications contain both general elements and elements related to learning an occupation, and both formal and informal learning processes play a role in the acquisition of key qualifications. They are related to the personal development of individuals (inasmuch as this is related to a specific occupation).

Third, key qualifications have transfer value. They broaden the deployment range of employees in work, and employees are able to acquire new specific knowledge more quickly; in the context of this study this is known as multi-functionality. With the aid of interdisciplinary knowledge in the field of process engineering, for instance, a service mechanic with MTS-E education can settle into

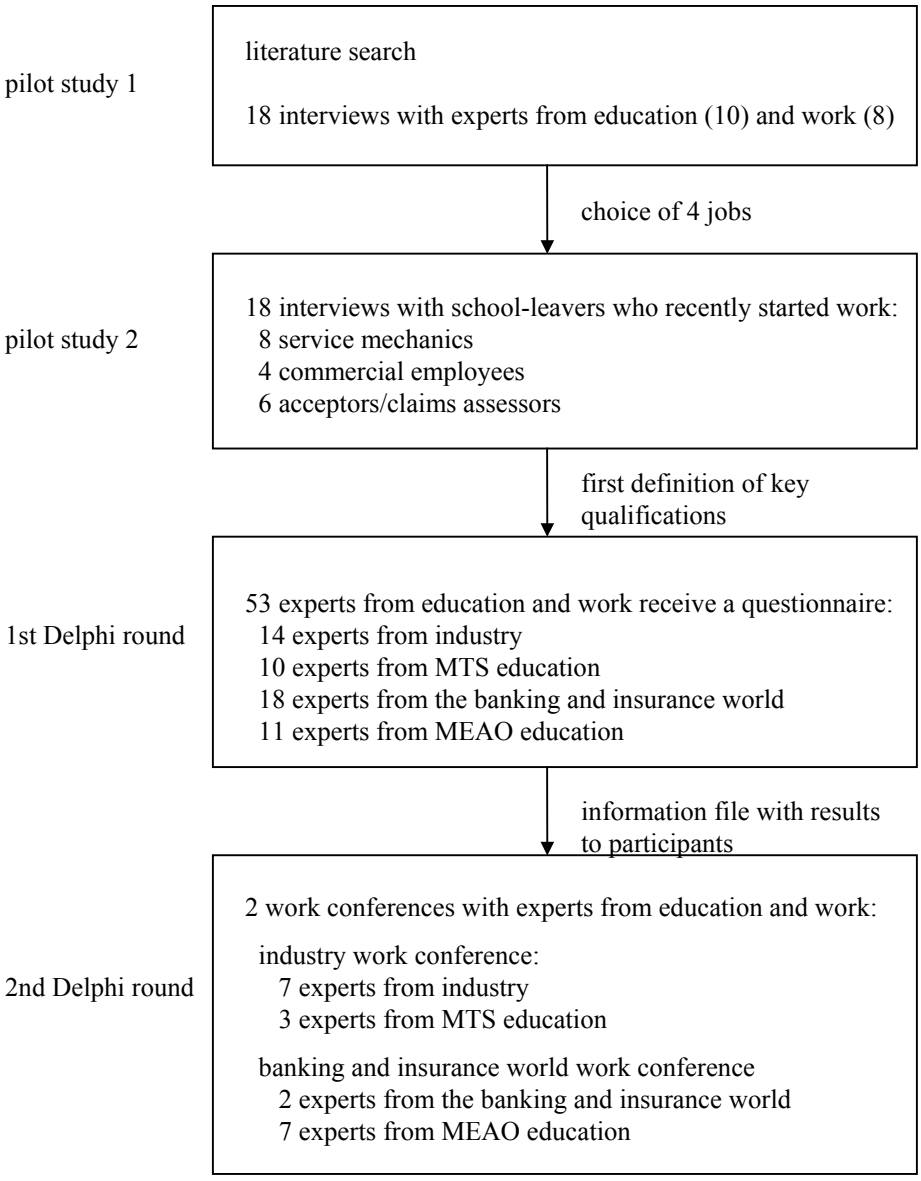

FIGURE 1. *A Delphi study on policy about key qualifications.*

a new job quickly, for example, installing central heating. A basic knowledge of some software programs enables a commercial employee working in a bank with a background of MEAO-C education to learn quite quickly how to use his word processor and how to call up and process client data. Broad expertise improves communication with colleagues from other disciplines and enhances working in interdisciplinary groups.

In brief, key qualifications enable employees to respond more quickly and efficiently to (a) changes in their work, thanks to their broad expertise and interdisciplinary knowledge, (b) (unpredictable) changes on the labor market, because the new specific knowledge that is required can be acquired efficiently and effectively on the basis of key qualifications, and (c) transitions within a career. Key qualifications increase the mobility of employees.

The Importance of Key Qualifications

From the Delphi study on policy it appears that the 53 experts found key qualifications important to enable employees to work competently (Table 2). The experts who were consulted during the empirical study mentioned such key qualifications as self-reliance, responsibility, accuracy, quality awareness, social skills, and a willingness to take part in further learning, for all categories studied (service mechanic, commercial employee, acceptor and claims assessor) as being important to very important (values of 4.5 or higher on a scale of 1–5; 1=totally unimportant, 2=somewhat unimportant, 3=not important/not unimportant, 4=somewhat important, 5=very important). The ability to handle information and to cope with stress were also mentioned. A service mechanic must also specifically have knowledge and cognitive skills such as problem solving, methodical thinking, as well as exercising initiative and the ability to be decisive and creative. A commercial employee, an acceptor and a claims assessor must, also especially have communicative skills and commercial insight, and they must be presentable. It was the view of experts that it is no longer possible to succeed without key qualifications either in the labor market or selection processes.

A brief sketch of the profile of an MTS-E school-leaver who recently started work as a service mechanic with the necessary key qualifications to be able to work effectively reads as follows:

> A service mechanic has broad expertise and some knowledge of mechanics, process engineering, and software programs. A service mechanic is able to apply his/her knowledge effectively in practice, both in repairing faults and in relations with clients. A service mechanic repairs faults according to certain priorities (in small companies) or depending on the order in which they come in via a dispatcher (in larger companies). A service mechanic repairs a fault independently, if possible. When a fault is identified, a service mechanic works

TABLE 2
Mean importance attached to key qualifications by experts from work

Key qualifications	Experts		
	Industry (n=14)	Banking (*n*=14)	Insurance (*n*=4)
General–instrumental dimension			
Ability to handle information	4.54	4.50	4.25
Ability to plan work	3.93	3.77	3.50
Interdisciplinary knowledge	4.14	3.93	3.25
Quality awareness	4.71	4.79	4.50
Commercial insight	3.93	4.71	4.50
Motivation for lifelong learning	4.79	4.86	4.25
Cognitive dimension			
Abstract thinking	4.29	3.21	3.25
Methodological thinking	4.71	4.07	3.75
Solving problems	4.86	4.21	4.50
Personality dimension			
Self-reliance	4.79	4.79	4.75
Sense of responsibility	4.86	4.93	4.75
Accuracy	4.79	4.71	4.50
Decisiveness	4.57	4.21	5.00
Exercising initiative	4.71	4.36	5.00
Coping with stress	4.50	4.64	4.25
Creativity	4.57	4.29	4.25
Socio-communicative dimension			
Social skills	4.57	4.71	4.75
Ability to express self orally	—	4.57	4.75
Ability to express self in writing	4.00	4.00	4.75
Knowledge of modern languages	3.71	3.50	2.25
Socio-normative dimension			
Complying with safety measures	4.71	4.71	2.50
Presentability	4.14	4.79	3.25
Knowledge of work organization	3.71	3.86	3.25
Strategic dimension			
Showing critical attitude toward work and one's self interests	4.14	4.31	3.75

1=totally unimportant, 2=somewhat unimportant, 3=not important/not unimportant, 4=somewhat important, 5=very important; important to very important ? 4.5

systematically, forming a picture of the fault as a part of the whole system, by looking, listening (also to the client!), measuring and systematically eliminating possible causes until the actual cause of the fault is located. If this process takes too long, a service mechanic takes the initiative promptly and calls in the help of other people (the helpdesk or colleagues). A service mechanic then repairs the fault while bearing in mind the costs involved. A service mechanic can, when necessary, devise creative temporary solutions. Whenever parts have to be ordered first, a service mechanic makes a clear agreement with the client. If necessary, a service mechanic provides the client with information about the operation and maintenance of the equipment. In addition, normal and preventive maintenance is carried out and, if required, new equipment is installed. A service mechanic is aware that he must do a good job (repair a fault satisfactorily the first time, finish off his work efficiently, tidy up afterwards, and keep the client well informed) and must appear presentable to the client. A service mechanic is flexible enough to service equipment at the weekend or at night, if that suits the customer better, but the service mechanic can also stand up for himself in a positive sense when the customer is too demanding. If the knowledge of a service mechanic is inadequate, the service mechanic indicates promptly that he/she needs a refresher course. A service mechanic is motivated to keep abreast of developments in his field, partly on his own, and partly by following a course. A service mechanic completes his administration accurately each day and also handles his tools with care. A service mechanic works together with colleagues when necessary and regularly exchanges details with them about repairs. If relations with clients are poor, the service mechanic takes the initiative to do something about this.

Interpretation of Key Qualifications by Occupation

On the basis of data from the Delphi study, the most important key qualifications that MTS-E and MEAO-C school-leavers must possess were described comprehensively. For the first group, the basis was the data gathered from the service mechanics that had recently started work, from experts in the industrial sector, and from educational experts with knowledge of MTS-E education. For the second group, the basis was data gathered from the commercial employees—acceptors and claims assessors—who had recently started work, from experts in the banking and insurance world, and from educational experts with knowledge of MEAO-C education. Due to a lack of space, only the key qualifications *ability to express oneself orally* and *abstract thinking* are mentioned as examples.

Experts defined ability to express oneself orally of an MEAO-C school-leaver

as follows:

> Employees at the beginning of their career are able to carry out various sorts of conversation with clients (informative, advisory, sales, complaints) by telephone or in person in relation to standard products. They are also able to participate actively in (work) consultations and group conversations.

The ability to express oneself orally of an MTS-E school-leaver reads, according to the experts, as

> a mechanic is able to communicate clearly and unambiguously (about technology) with customers and colleagues.

The key qualification abstract thinking was not considered important enough for the MEAO-C school-leavers to describe it separately, whereas this key qualification was considered very important for MTS-E school-leavers. Abstract thinking for MTS-E school-leavers was defined as

> a service mechanic is able to visualize the operation of a system and its component parts. For example, a service mechanic is able to localize a fault by visualizing the operation of the equipment in this application, taking into account the production process, and then to look, listen and measure, possibly using a diagram or a service manual.

Acquiring Key Qualifications

Secondary vocational education (both theory and practical components) must play a central role in the acquisition of key qualifications in the view of the 53 experts from education and work that were interviewed. There are clear indications of a correlation between the nature of key qualifications and the place where they can best be acquired. The acquisition or further development of the cognitive and socio-communicative dimensions in particular should mainly take place in secondary vocational education.

For the dimensions distinguished, various learning situations are considered suitable (within school or during work placement). Work placement is specifically mentioned in order to further develop social skills and learn how to handle information. Key qualifications from the cognitive dimension (e.g., problem solving, methodical thinking), and general-instrumental dimension (e.g., ability to plan one's work, and having interdisciplinary knowledge), as well as the key qualifications the ability to express oneself in writing and knowledge of modern languages from the socio-communicative dimension can be acquired, experts claim, to a great extent within school. For most of the remaining key qualifications only a theoretical basis can be laid down in secondary vocational education. These will be further developed in practice during and outside work. This relates especially to key qualifications from the socio-normative, strategic, personality,

and a few from the general instrumental dimensions. The key qualifications that the experts believe are acquired or further developed specifically during work are decisiveness, the ability to cope with stress, exercising initiative, a critical attitude toward work and one's own interests. Finally, it is striking that in the view of the experts the pre-school family situation plays a crucial role in the acquisition of the key qualifications of creativity, abstract thinking. One expert even believes, "You either have it or you don't" when you come to school.

The next question is, "How key qualifications can best be acquired?" The Delphi study was restricted to considering the way in which key qualifications could be acquired along formal learning routes. Experts showed a preference for traditional instruction methods such as lecturing, for the acquisition of key qualifications from the cognitive dimension, such as abstract thinking, planning, problem solving, handling information, and interdisciplinary knowledge, and key qualifications from the communicative dimension, such as the ability to express oneself in writing, and a knowledge of modern languages. For the remaining key qualifications from the personality dimension, the socio-normative dimension, and social skills, experts mainly advised practical learning (outside school, while learning one's occupation in practice, or after school during work) oral instruction methods, such as project education, problem-solving education and, in addition, participatory learning or learning to solve core problems. Application in the work situation was also considered necessary for the acquisition of these key qualifications. When these key qualifications are acquired outside school while learning an occupation in practice, the experts feel that it is necessary, on the basis of one or more clear assignments, that more high-quality work placements or training places are experienced in organizations that differ in their organizational structure. The link-up between theoretical and practical learning is essential here. Another form found to be very suitable in this context is participatory learning,[9] especially for the development of self-reliance among students.

One significant conclusion, in the view of the experts consulted, was that most of the key qualifications can best be acquired in secondary vocational education and through nontraditional instructional methods within the context of an occupation. For example, they pointed quite frequently to the possibilities of project education in which key qualifications such as social skills, self-reliance, problem-solving, and decisiveness could be acquired while learning all the elements of an occupation in their natural correlation.

Discussion

In view of the growing need for flexible, broadly-skilled employees and broadened vocational education, the term key qualifications has been given a new interpretation in this study. The idea of key qualifications as general skills (independent of occupations), as advocated in particular by Mertens (1974), has

been abandoned. To practice an occupation effectively, it is necessary to have key qualifications (broad expertise and contextualized general skills), as well as specific expertise. The term key qualifications encompasses six dimensions: general-instrumental, cognitive, personality, socio-communicative, socio-normative, and strategic. The substance of key qualifications must be determined for each occupation separately. They are contextualized within an occupation. The social skills that a service mechanic must have differ from those that a commercial employee needs to possess.

One disadvantage of the Delphi method employed for this study was that the key qualifications had to be mentioned separately, whereas they are used together within an occupation. It would, therefore, it seems sensible for a follow-up study to identify core problems. Core problems incorporate the complexity of work situations (Laur-Ernst, 1983, 1984; Nieuwenhuis, 1991; Onstenk, 1997; Onstenk, Moerkamp, Voncken, & van den Dool, 1990). Core problems are complex problems and dilemmas that are central to the practice of an occupation. They are problems that an employee regularly comes across, which are characteristic of that occupation, and for which employee are expected to have a solution. They involve considerations and choices relating to dilemmas, where the application of knowledge and skills and the use of the appropriate register of actions will determine whether someone is a more or a less professional worker. Core problems are characterized by uncertainty and the balancing of conflicting interests in complex situations, in which choices have to be made time and again. Key qualifications play a central role in dealing with core problems.

Core problems could reduce the problem of translating key qualifications into curricula in vocational education. By confronting students with realistic or simulated core problems, they could acquire the necessary key qualifications at the same time. The Delphi study revealed that several authors (Laur-Ernst, 1984; Mulder, 1997; Onstenk et al., 1990) and experts are of the opinion that confrontation with core problems could stimulate the acquisition of key qualifications in secondary vocational education.

The first step toward developing an instrument to identify the core problems of an occupation has meanwhile been taken by Blokhuis and van Zolingen (1997). They identified among other things the core problems of the service manager working in a garage and of the travel employee working independently in a travel agency, by conducting extensive interviews with the employees and by means of a questionnaire. Further study is required into the question of whether these core problems should be incorporated into the Dutch national qualification structure[10] by formulating national attainment targets, or in some other way outside the national attainment targets. Blokhuis and Van Zolingen suggested a number of possible scenarios.

A new and promising view that agrees with the interest of Blokhuis and van Zolingen (1997) in core problems, and with the description of key qualifications of van Zolingen based on occupations has been developed by Stasz (1997, 1998; Statz, McArthur, Lewis, & Ramsey, 1990; Statz, Ramsey, Eden, DaVanzon, Farris, & Lewis, 1993; Statz, Ramsey, Eden, Melamind, & Kaganoff, 1996). In the 1990s Statz added a fresh view to the research on key qualifications in the U.S. She believed that the concept of skill requirements used to analyze jobs and individuals (e.g., SCANS, 1991, 1992), ignores the work context and the fact that workplaces are shaped by human choice. Learning work skills is a social activity and the traditional conception of skills pays too little attention to the possibilities of workplace reforms that might improve skills and productivity. Stasz takes a socio-cultural perspective and constructivist view (see also Darrah, 1992, 1994, 1995; Lave & Wenger, 1991; Orr, 1996; Wenger, 1998). She views skills as features of the workplace, as a social system, and not just as features of individuals or jobs. It is all about how people actually work and how workplaces shape work and learning. Stasz (1998) tries to improve the understanding of skills as they are constituted in technical work both by extending the theoretical conceptions of skills and by providing empirical observation of skills in practice. Like van Zolingen (1995), Statz focuses her research on problem solving, communications, and teamwork.

> However, while generic skills (key qualifications) are identifiable in all jobs, their specific characteristics and importance vary between jobs. The characteristics of problem solving, team work and communication requirements are related to job demands, which in turn depend on the purpose of the work, the tasks that comprise the job, the organization of the work, and other aspects of the work context. (p. 198)

Stasz observes and interviews individual workers as well as senior managers, staff, line managers and human resource personnel to get a full picture of the work as it is socially constructed or defined in the workplace. Stasz research seems promising because she has a holistic view of occupations and working people that seems to give a much fuller picture of reality of the workplace today.

Experts were of the opinion that nontraditional instructional methods, such as problem-directed learning and project education, as well as simulation and practical learning, are very suitable for acquiring key qualifications in vocational education. A heterogeneous open curriculum would, therefore, seem to be most suitable for the acquisition of key qualifications in vocational education (Heidegger & Rauner, 1989; Laur-Ernst, 1989). This type of curriculum would be flexible in the use of instructional methods, the content of teaching material, and the alternation of theory and practical learning. Attention is being paid to the link-up between the student experiences (by means of project education) on the one hand, and their future occupations (by being confronted with core problems) on the other.

And there is in this curriculum a new balance between the acquisition of knowledge and skills. A few examples of developments in the direction of such a curriculum are the work of Stasz (1998) in the U.S., work on apprenticeships in the U.S. (Bailey, 1993; Hamilton & Hamilton, 1992a, 1992b) and the U.K. (Ainley & Rainbird, 1999) and the work of De Bruijn and Moerkamp (1997) and Mulder (1997) in the Netherlands.

In fact Stasz' (1998) ideas about teaching generic skills (key qualifications) in the U.S. are much like those of a heterogeneous open curriculum. Stasz believes that generic skills (key qualifications) must be defined and taught in ways that are contextually authentic. She proposes methods such as properly designed learning environments within schools based on constructivist views, traditional apprenticeships, and cognitive apprenticeships. And within schools teachers adopt a variety of non-didactic teaching techniques. Such as coaching, one-on-one tutoring, and modeling. Teacher preparation and staff development in the future should be in continuous contact with experts and developments in the world of work. At the moment few teachers appear to have adopted new instructional methods and their knowledge of the world of work is insufficient.

The U. S. Department of Labor has funded a series of school-to-work demonstration projects (named job performance learning) designed to help change the way students learn basic workplace skills by applying the principles behind the German system, particularly the use of workplaces as learning environments and the meaningful interrelation of learning and work. Each project involved work-based learning strategies that combine work and classroom learning (Hamilton & Hamilton, 1992a, 1992b).

In the U.K. the 'Modern Appreticeship programs' are an example of a new method with the aim to acquire key qualifications (named key skils in the U.K.) in an authentic learning environment (Ainley, & Rainbird, 1999). In Modern Apprenticeships on- and off the job training are integrated. For example assignments designed in school were expected to be completed with the assistence of both college staff and workplace supervisors. The Modern Apprenticeship is designed to be an integrated programme of vocational education and training which will allow progression from craft to technician, and possibly to graduate, levels.

Since 1995, the year in which this study was published in the Netherlands, many positive developments in Dutch vocational education have indeed occurred, which are moving in the direction of the above scenario. These include more attention to project education, problem-directed education, supervised independent learning, and learning in task groups (De Bruijn & Moerkamp, 1997). Mulder (1997) recently conducted research into the optimal structure of practical learning situations for vocational education. She too points to the importance of a diversity of instructional methods, and confrontation with and reflection upon core

problems. The specification and application of core problems in vocational education, however, still require a great deal of study. One aspect that cannot be overlooked, mentioned by Stasz (1998) in the U.S. and also by Van Zolingen and Mulder in the Netherlands, is the necessity for further, continuing professionalization of teachers, who will have to implement all these changes in their schools (Kwakman, 1999).

Developments in the area of core problems and the growing attention in The Netherlands for the close cooperation between business and vocational education expressed in the 1996 Adult Educational and Vocational Training Bill (in Dutch, WEB) are reflected in the focus of the federal policy of the United States in school-based vocational education and training in the 1990s that is characterized by more emphasis on integration of vocational and academic education, articulation of secondary and post-secondary education, and collaboration of education, business, and labor. U.S. legislation consists of three Acts: the 1990s Amendments to the Carl Perkins Act, Goals 2000 and the 1994 School-to-Work Opportunities Act (Copa, 1998). The School-to-Work Opportunities Act is designed to improve student learning, in-school retention, and transition to the workplace by improving the quality and relevance of education for all students through experiences that integrate school-based and work-based learning and improve students' knowledge of and access to career opportunities (Stern, Finkelstein, Stone, Latting, & Dornsife, 1995). A big difference between the U.S. and the Netherlands is of course the national qualification structure that gives direction to the transition from school to work on a national level in the Netherlands and the huge diversity of initiatives concerning the transition from school to work throughout the U.S.

A quite different point of discussion is whether the attention that trade and industry is paying to key qualifications corresponds to the ideas about students' personal development that can be found in the old socio-cultural ideal (Brater & Bauer, 1990; Hofland, Jarvis, & Griffin, 1998; Jansen, 1994). Although the experts in this study want young employees with a particular type of personal development, it is not clear whether these employees will be able to use and further develop all their key qualifications in their work too. Employees are often faced with a heavy workload, few opportunities for learning on the job, either formally or informally, an absence of career planning, poor communication and promotion of interests, and short, temporary employment contracts. Moreover, there is no question of a workplace that provides a powerful learning environment where key qualifications can be acquired or further developed (Nieuwenhuis & Onstenk, 1994). This raises the question to what extent vocational education must gear itself toward the (limited) need of trade and industry for broadly-qualified employees.

Endnotes

1. Since 1997 the Dutch system of vocational education has been restructured in one national qualification structure consisting of four levels and two learning trajectories, school-based vocational training (like senior secondary vocational education) and a dual learning trajectory (like apprenticeships). In 1997, 700 different qualifications were registered. 19 national bodies for vocational education are responsible for vocational education in a specific sector. Social partners (especially employers) are primarily responsible for determining occupational profiles. National bodies are responsible for translating these into vocational educational profiles and attainment targets for specific qualifications in the qualification structure. Schools for vocational and adult education in a specific region (in total 46 ROCs) remain responsible for the actual curriculum designed to attain these. Traditionally, the involvement of companies in full-time education was limited to practical training periods. Now social partners are involved in the development of the curriculum as well for instance in creating vocational training profiles. In the Netherlands vocational education is becoming a shared responsibility between the educational system and business.

MBO: *Middelbaar Beroepsonderwijs.* Upper Secondary Vocational Education.

2. MEAO: *Middelbaar Economisch en Administratief Onderwijs* : Upper Vocational Secondary Education in Business and Adminstration.

3. MTS: *Middelbare Technische School* : Technical Secondary School.

4. Experts from industry, banking, or insurance had to meet the following criteria: At least 2 years experience in their job, a broad knowledge of the job that were being researched, knowledge of the qualificatiosn needed by the MBO school-leavers, knowledge of the ties of their company with the MBO schools, knowledge of the careers of MBO school-leavers, and knowledge of personnel problems involving these jobs. Educational experts had to meet the following criteria: At least 6 month experience in a commission for curriculum development, and teacher in the MBO.

5. Ten interviews were conducted with experts from the field of activity, including AKZO (now AKZO NOBEL), Océ, KEMA, Philips, AMRO (now ABN/AMRO), RABO, and eight interviews with experts from the world of education, including teachers, work placement supervisors, a student counselor, and two deputy principals of MTS and MEAO institutes.

6. Eighteen interviews were conducted before the Delphi rounds and were composed of: four extensive interviews with MEAO school-leavers who recently started work in a bank, six extensive interviews with MEAO school-leavers recently starting work in an insurance company or with a broker, and eight extensive interviews with MTS school-leavers who had recently started work in the service sector.

7. I have explained the working method followed on the basis of the initial job of *service mechanic.* In the course of extensive interviews the work of service mechanics was mapped out. Finally, 12 task areas were distinguished: receiving faults, looking for faults, repairing faults, finishing work on faults, reporting faults, installing new

equipment and adjustments, providing advice to users, carrying out maintenance, work preparation, work consultation, maintaining contact with clients, colleagues or supervisor, and education. Service mechanics were also asked which of the 25 selected key qualifications were needed for each of task area, and they asked to define these. In the case of the task area *looking for faults* it was, for instance, the following key qualifications in particular that appeared important: abstract thinking, methodical thinking, problem solving, handling information, decisiveness, exercising initiative, social skills and understanding of the organization. The task area *providing advice to users* mainly required social skills, ability to express oneself orally, decisiveness, commercial insight, and understanding of the organization.

8. The 53 participants consisted of 14 experts from the field of activity of MTS-E students, 6 experts from MTS education, 4 experts from the service structure of MTO, 18 experts from the field of activity of the MEAO-C students, 6 experts from MEAO education, and 5 experts from the service structure of MEAO.

9. Alternation of theory and practical learning.

10. See Endnote 1.

References

Ainley, P., & Rainbird, H. (Eds.) (1999). *Apprenticeship: Toward a new paradigm of learning*. London: Kogan Page.

Appelbaum, E., & Batt, R. (1994). *The new American workplace: Transforming work systems in the United States.* Cornell, NY: Cornell University Press.

ASTD/DOL (ASTD/Department of Labor). (1988). *Workplace basics: The skills employers want*. Alexandria: Authors.

Bailey, T. (1993). Can youth apprenticeship thrive in the United States? *Educational Researcher*, *22* (3), 4-10.

Blokhuis, F., Coeck, G., Vermeesch, F., & Vilters, I. (1999). *Sleutelvaardigheden in het beroepsgerichte onderwijs in Nederland en Vlaanderen* [Key qualifications in vocational education in the Netherlands and Flandres]. Brussels-Hertogenbosch: GENT-4, CINOP.

Blokhuis, F. T. L., Eising, M., & van den Ende, M. (1998). *Servicegericht: Sleutelkwalificaties, kernproblemen en de servicedocumenten* [Service oriented: Key qualifications, core problems and the service documents] Brussels-Hertogenbosch: CINOP.

Blokhuis, F. T. L., & van Zolingen, S. J. (1997) *De kern te pakken: Sleutelkwalificaties, kernproblemen en de landelijke kwalificatiestructuur* [Catching the core: Key qualifications, core problems and the national qualification structure]. Brussles-Hertogenbosch: CINOP and Enschede, Vakgroep Curriculumtechnologie, Toegepaste Onderwijskunde, Universiteit Twente.

Brater, M., & Bauer, H. G. (1990). Schlüsselqualifikationen–Der Einzug der Persönlichkeitsentwicklung in die berufliche Bildung? [Key qualifications–The entrance

of personality development in vocational education?] In H. Herzer, G. Dybowski, & H. G. Bauer (Hrsg.), *Methoden betrieblichen Weiterbildung* [Methods in human resource development] (pp. 198-222). Eischburn: RKW.

Carnevale, A. P. (1991). *America and the new economy.* San Francisco: Jossey Bass.

Carnevale, A. P., Gainer, L. J., & Melzer, A. S. (1990). *Workplace basics: The essential skills employers want*. San Francisco: Jossey Bass.

Copa, G. (1998). The demarcation line in funding for school-based vocational education and training in the United States. In W. J. Nijhof & J. Streumer (Eds.), *Key qualifications in work and education* (pp. 79-89). Dordrecht: Kluwer Academic.

Darrah, C. N. (1992). Workplace skills in context. *Human Organization*, *51*(3), 264-273.

Darrah, C. N. (1994). Skill requirements at work. *Work and Occupations, 21*(1), 64-84.

Darrah, C. N. (1995). Workplace training, workplace learning: A case study. *Human Organization*, *54*(1), 31-41.

Davenport, T. H., & Prusak, L. (1998). *Working knowledge.* Boston: Harvard Business School Press.

De Bruijn, E., & Moerkamp, T. (1997). *De studeerbaarheid van het MBO* [Learnability of secondary vocational education]. Amsterdam: SCO-Kohnstamm Instituut.

De Jong, M. W., Moerkamp, T., Onstenk, J. H. A. M., & Babeliowsky, M. (1990). *Breed toepasbare beroepskwalificaties in leerplan en beroepsprakrijk* [Broadly applicable occupational qualifications in curriculum and occupational practice]. SCO: Amsterdam.

Delors, J. (1996). *Learning, the treasure within*. Paris: UNESCO.

Den Boer, P., & Hövels, B. (1999). *Contextontwikkelingen en competenties* [Context developments and compentencies]. Nijmegen: ITS (OSA publicatie).

De Sitter, L. U. (1994). *Synergetisch produceren. Human resources mobilisation in de produktie: een inleiding in structuurbouw* [Synergetic production methods. Human resource mobilization in production: An introduction in building structures]. Assen: Van Gorcum.

Drucker, P. F. (1993). *Postcapitalist society.* Oxford: Butterworth Heinemann.

Du Gay, P., & Salaman, G. (1992). The cult(ure) of the customer. *Journal of Management Studies*, *29*, 615-633.

Elbers, D., Heckenauer, M., Mönikes, W., Pornschlegel, H., & Tillmann, H. (1975). Schlüsselqualifikationen–Ein Schlüssel für die Berufsbildungsforschung? [Key qualifications a key for research in vocational education?]. *Berufsbildung in Wissenschaft und Praxis*, *4*, 26-29.

Faure et al. (1972). *Learning to be: The world of education today and tomorrow*. Paris: UNESCO.

Geißler, K. A. (1990). Mit dem Qualifikations- “Schlüssel” nach oben [Up with the qualification- key]. *Frankfurter Rundschau*, p. 35.

Hamel, G., & Prahalad, C. K. (1994). *Competing for the future.* Boston: Harvard Business School Press.

Hamilton, S. F., & Hamilton, M. A. (1992a). A progress report on apprenticeships. *Educational Leadership*, *49*(6), 44-47.

Hamilton, S. F., & Hamilton, M. A. (1992b). Bridging the school-to-work gap. *School Administrator*, *49*(3), 8-15.

Heidegger, G., & Rauner, F. (1989). *Berufe 2000. Berufliche Bildung für die industrielle produktion der Zukunft* [Occupations 2000. Vocational education for the industry in the future]. Düsseldorf: Minister für Arbeit, Gesundheit und Soziales des Landes Nordrhein-Westfalen.

Hofland, J., Jarvis, P., & Griffin, C. (Eds.) (1998). *International perspectives on lifelong learning*. London: Kogan Page.

Hoof, J. J. van (1998). Nieuwe institutionele kaders en de aansluiting tussen beroepsonderwijs en arbeidsmarkt [New structures linking up vocational education and the labour market]. *Tijdschrift voor Arbeidsvraagstukken*, *14*(1), 85-97.

Hövels, B. W. M., & van Dijk, C. A. M. (1989). *Beroepspraktijk en opleidingen van elektronici*: *een onderzoek naar intredefuncties*, *beroepsloopbanen en de aansluiting tussen opleiding en beroepspraktijk van elektronici met MTS en HTS opleiding* [Occupational practice and courses of electronical engineers: a research project concerning first jobs, careers and the link between education and occupational practice of electronical engineers]. Den Haag: COB/SER.

Hövels, B. W. M., & Vink, J. (1991). *Beroepspraktijk en aansluiting voor MTS-elektronici* [Occupational practice and the link between school and work of electronical engineers graduated from secondary vocational education]. Nijmegen: ITS.

Hurrelmann, K. (1975). *Erziehungssystem und Gesellschaft* [Educational system and society]. Reinbeck: Rowohlt.

Jansen, Th. (1994). *Gedeelde verschillen. Algemene volwassenenvorming in een veelvormige wereld* [Shared differences. Adult education in a pluriform world]. (diss.). Brussels–Gravenhage: VUGA.

Kearns, P. (2001). *Generic skills for the new economy. Review of research*. Leabrook, Australia: NCVER.

Kwakman, C. (1999). *Leren van docenten tijdens de beroepsloopbaan*. *Studies naar professionaliteit op de werkplek in het voortgezet onderwijs* (diss.) [Teachers' learning during their career. Studies on professionalization on the job in general secondary education]. Nijmegen: KUN.

Laur-Ernst, U. (1983). Zur Vermittlung berufsübergreifender Qualifikationen. Oder: Warum und wie lernt man abstraktes Denken? [About teaching general qualifications. Or: why and how do you acquire abstract thinking?]. *Berufsbildung in Wissenschaft und Praxis*, *12*(6), 187-190.

Laur-Ernst, U. (1984). *Entwicklung beruflicher Handlungsfähigkeit* [Developing

competence] (diss.). Frankfurt am Main: Peter Lang.

Laur-Ernst, U. (1989). Mehr berufliche Handlungsfähigkeit entwickeln–Konzepte für eine umfassendere Ausbildung [Developing more competence–A concept for a general education]. In BIBB (Ed.), *Neue Berufe in der Elektrotechnik* [New occcupations in electrical engineering] (pp. 93-103). Nürnberg: BW Verlag und Software.

Lave, J., & Wenger, E. (1991). *Situated learning.* Cambridge: Cambridge University Press.

Linstone, H. A., & Turoff, M. (1975). *The delphi method*. Reading, MA: Addison-Wesley.

Mertens, D. (1974). Schlüsselqualifikationen. Thesen zur Schulung einer modernen Gesellschaft [Key qualifications. Theses on schooling for a modern society]. *Mitteilungen aus der Arbeitsmarkt- und Berufsforschung*, 7, 314-325.

Mirvis, P. H. (Ed.). (1993). *Building the competitive workforce. Investing in human capital for corporate success.* New York: John Wiley & Sons.

Mulder, R. H. (1997). *Leren ondernemen. Ontwerpen van praktijkleersituaties voor het beroepsonderwijs* [Learning how to do business. Designing practical learning for vocational education] (diss.). Rotterdam: Erasmus Universiteit.

Nieuwenhuis, A. F. M. (1991). *Complexe leerplaatsen in school en bedrijf. Een studie naar de implementatie en effecten van participerend leren in het middelbaar beroepsonderwijs* [Complex practical learning situations in school and work. A study concerning the implementation and effects of apprenticeship models in vocational education] (diss.). Groningen: RION.

Nieuwenhuis, A. F. M., & Onstenk, J.H.A.M. (1994). Werkend leren in opleiding en beroep: de werkplek als krachtige leeromgeving [Integration of work and learning in training and in occupations: the workplace as a strong learning environment]. *Comenius*, *14* , 198-220.

Nijhof, W. J., & Remmers, J. L. M. (1989). *Basisvaardigheden nader bekeken* [A closer look at basic skills]. Enschede: Faculteit der Toegepaste Onderwijskunde, Vakgroep Curriculumtechnologie, Universiteit Twente.

Nijhof, W. J., & Streumer, J. (1994a). *Verbreed beroepsonderwijs* [Broadening vocational education]. De Lier: ABC.

Nijhof, W. J., & Streumer, J. (1994b). *Flexibility in training and vocational education.* Utrecht: Lemma.

Nijhof, W. J., & Streumer, J. (Eds.). (1998). *Key qualifications in work and education.* Dordrecht: Kluwer Academic.

OECD [Organization for Economic Co-operation and Development]. (1996). *Lifelong learning for all.* Paris: OECD.

Onstenk, J. (1997). *Lerend leren werken. Brede vakbekwaamheid en de integratie van leren,werken en innoveren* [Learning to work learning. Broad occupational competence and the integration of learning, working and innovation] (diss.). Delft:

Eburon.

Onstenk, J. H. A. M., Moerkamp, T., Voncken, E., & van den Dool, P. C. (1990). *Leerprocessen in stages* [Learning processes during doing practice]. Amsterdam: SCO.

Orr, J. (1996). *Talking about machines: An ethnography of a modern job*. Ithaca, NY: Cornell University Press.

Peters, F. J. M., Streumer, J. N., & Nijhof, W. J. (1991). *De opleiding van MTSers elektronica en technische computerkunde: naar aanpassing en vernieuwing van eindtermen* [Schooling for electronical engineer and technical computer science in secondary vocational education: towards adjustment and renewal of attainment targets]. Enschede: OCTO, Universiteit Twente.

Reetz, L. (1989). Zum Konzept der Schlüsselqualifikationen in der Berufsbildung (Teil I, II) [The concept of key qualifications in vocational education]. *Berufsbildung in Wissenschaft und Praxis*, *18*(5, 6), 3-10 en 24-30.

Resnick, L. B., & Wirt, J. G. (Eds.). (1996). *Linking school and work. Roles for standards and assessment.* San Francisco: Jossey Bass.

Rothwell, W. J. (1996). *Beyond training and development: State-of-the-art strategies for enhancing human performance*. New York: Amacom.

SCANS [Secretary's Commission on Achieving Necessary Skills]. (1991). *What work requires from schools: A SCANS report for America 2000.* Washington DC: U.S. Department of Labor.

SCANS [Secretary's Commission on Achieving Necessary Skills]. (1992). *Learning a living: A blue print for high performance.* Washington DC: U.S. Department of Labor.

Schumann, M., Baethge-Kinsky, V., Kuhlmann, M., Kurz, C., & Neumann, U. (1994). *Trendreport Rationalisierung. Automobilindustrie, Werkzeugmaschinenbau, Chemische Industrie* [Trend report rationalisation. Car industry, machine industry, chemical industry]. Berlin: Reiner Bohn Verlag, Edition Sigma.

Stasz, C. (1997). Do employers need the skills they want? Evidence from technical work. *Journal of Education and Work*, *10*(3), 205-223.

Stasz, C. (1998). Generic skills at work: implications for occupationally-oriented education. In Nijhof, W. J. & Streumer, J. N. (Eds.), *Key qualifications in work and education* (pp. 187-206). Dordrecht/Boston: Kluwer Academic.

Stasz, C., McArthur, D., Lewis, M., & Ramsey, K. (1990). *Teaching and learning generic skills for the workplace.* Santa Monica: RAND.

Stasz, C., Ramsey, K., Eden, R., DaVanzo, J., Farris, H., & Lewis, M. (1993). *Classrooms that work: Teaching generic skills in academic and vocational settings.* Santa Monica: RAND.

Stasz, C., Ramsey, K., Eden, R., Melamid, E., & Kaganoff, T. (1996). *Workplace skills in practice: Case studies of technical work.* Berkeley: University of California, National Center for Research in Vocational Education.

Stern, D., Finkelstein, N., Stone, J. R., Latting, J., & Dornsife, C. (1995). *School to work. Research on programs in the United States*. London: Falmer Press.

Thompson, P., & Warhurst, C. (Eds.). (1998). *Workplaces of the future*. London: Macmillan.

Tijdens, K. (1986). *Automatisering, interne arbeidsmarkt en segmentering* [Automatization, internal labour market and segmentation] (diss.). Amsterdam: Vakgroep Sociaal Wetenschappelijke Informatica, Universiteit van Amsterdam.

Tijdens, K. (1989). *Automatisering en vrouwenarbeid. Een studie over beroepssegregatie op de arbeidsmarkt, in de administratieve beroepen en in het bankwezen* [Automatization and women's work. Research about the occupational segregation in the labour market, in administrative jobs and in banking] (diss.). Amsterdam: Universiteit van Amsterdam.

Tolner, T., van Sluijs, E., & Dankbaar, B. (1993). *Arbeidsorganisatie en dualisering van onderwijs* [Organisations and the integration of working and learning in education]. Den Haag: OSA.

U.S. Department of Labor, U.S. Department of Education. (2000). *Workplace essential skills: Resources related to the SCANS competencies and foundation skills*. Washington DC: Authors.

van Hoof, J. J., & Dronkers, J. (1980). *Onderwijs en arbeidsmarkt*: *een verkenning van de relaties tussen onderwijs*, *arbeidsmarkt en arbeidssysteem* [Education and labor market: An exploration of the relations between education, labor market and the labor system] Deventer: Van Loghum Slaterus.

van Zolingen, S. J. (1995). *Gevraagd sleutelkwalificaties. Een studie naar sleutelkwalificaties voor het middelbaar beroepsonderwijs* [Wanted: Key qualifications. A study on key qualifications for secondary vocational education] (diss.). Nijmegen: UDN, KU Nijmegen.

Wenger, E. (1998). *Communities of practice. Learning, meaning and identity*. Cambridge: Cambridge University Press, Vignette I+II en Coda 0 en Intro 1, 18-50 en 134-142.

Winslow, D., & Bramer, W. (1994). *Future work: Putting knowledge to work in the knowledge economy*. New York: The Free Press.

Womack, J. P., & Jones, D. T. (1996). *Lean thinking*. New York: Simon & Schuster.

Zabeck, J. (1989). Schlüsselqualifikationen–Zur Kritik einer didaktischen Zielformel. [Key qualifications–Criticizing a concept]. *Wirtschaft und Erziehung*, 3, 77-86.

Zuboff, S. (1988). *In the age of the smart machine: The future of work and power*. New York: Basic Books.

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Journal of Vocational Education Research, 27(2), pp. 243-255.

Perceived Knowledge Level, Utilization, and Implementation of School-to-Work by Preservice Teacher Educators in Ohio

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Abstract

This descriptive study determined the perceived knowledge level, utilization, and implementation of national and state school-to-work initiatives by preservice teacher educators in Ohio. Investigation focused on 359 preservice teacher educators from 13 state-supported universities. Ohio's teacher educators were most knowledgeable of and tended to utilize academic, school-based, and contextual teaching and learning components of school-to-work when preparing future teachers. They were least knowledgeable of and tended not to utilize the structural, work-based, and connecting activities components of school-to-work. Results provide direction for school-to-work professional development activity for preservice teacher educators.

Although federal funding ended for the School-To-Work Opportunities Act in October 2001, there is potential for employing its comprehensive framework for high-skill career preparation. With obtainable venture capital, opportunities abound to build strong workforce-oriented programs and to produce plans for statewide school-to-work systems. If successful components of school-to-work (STW) are to have a future, that future will rest largely on state and local government interest, business community involvement, and regional school districts' willingness to develop and institute structural measures such as block scheduling, business partnerships, and professional teacher development (Hettinger, 1998). To cultivate a future for STW it is necessary to assemble the efforts of all educational cohorts so that successful educational pathways can be provided for tomorrow's students.

The state of Ohio established a School-to-Work mission ensuring that "every Ohio child graduates from high school and beyond with the knowledge and skills needed to succeed in the ever-changing world of work—and is prepared for lifelong learning" (The School-to-Work Systems Integration Coalition, 1999, p. 9). This mission brings forth the necessity of weaving the concepts of school and work into the lives of students and the importance of preparing teachers to educate students in this manner. Thus, the professional development of educators is an important link in advancing the STW mission (Berns, 1997).

To address Ohio's STW mission and prepare future teachers to apply valuable STW concepts, it is necessary to implement a curriculum and educational plan that

addresses the needs of children and our society. Future teachers must understand the role of STW in enhancing the curriculum and preparing students to achieve in a new society (Berns, 1997). To assist preservice teacher educators in adequately preparing future teachers to accomplish this goal, preservice teacher educators' knowledge of and ability to apply STW components should be identified and the extent to which they prepare future teachers to use STW concepts should be determined.

Preservice teacher educators may need professional development, but a determination should be made regarding the focus of professional development. Once a focus is identified, organizations such as universities and state agencies can design professional development activities that will address Ohio's STW mission, effectively integrate STW into teacher preparation programs, and prepare future teachers for STW utilization. The purpose of this study was to determine what preservice teacher educators know about STW and how they perceive their preparation of future teachers to utilize STW in tomorrow's classrooms.

The School-to-Work Opportunities Act (STWOA) began as a $1.5 billion initiative signed during the Clinton Administration in May 1994. The School-to-Work Opportunities Act consisted of school-based learning components, work-based learning components, and activities that connect the two (National STW Information Learning Center, 2001). Although many misinterpreted the STWOA as a federally-funded program (Dembicki, 1998), it was actually a federal initiative that provided seed money for school districts to enact career exploration programs that utilize high academic standards and work force connections. School-to-work was not a program, but an approach to planning and delivering education (O'Conner, 1998).

The STW approach is rooted in the contextual teaching and learning philosophy that was first introduced by John Dewey in the early part of the 20th century (O'Conner, 1998). Much of it is based on cognitive research highlighting strong links between learning and doing. School-to-work incorporates aspects of community-based partnerships, work-based learning, and authentic instruction (Berns, 1997). Its components connect learning experiences at all levels with the surrounding environment (Parnell, 1995), address the needs of different types of intelligence as opposed to addressing intelligence as a fixed capacity (Gardner, 1983), and build learning capacity through real-life application (Dewey, 1941).

School-to-work principles are connected to constructivist learning theory and the idea of being actively involved in learning processes. According to Jerome Bruner (1966), learning is an active process in which learners construct new ideas or concepts based upon their current/past knowledge. Dewey (1941) reiterates the notion that the learner needs to do something and become engaged with the world.

School-to-work principles address the importance of helping all students acquire the knowledge, skills, abilities, and information to facilitate a smooth entry into the workforce. Through a career focus, STW connects classroom knowledge

with the world of work to bring relevance to learning and to provide a context for instructional content. School-to-work concepts also provide a means of achieving high academic standards by concentrating on contextual, applied, and focused learning. The underlying goal of STW is to provide graduating students with an educational background that creates options for college, training, or a well-paying job out of high school (National STW Information Learning Center, 2001).

School-to-work relies on students actively applying challenging classroom content within contexts such as internships and work-based training via community-based partnerships, thus connecting theory and praxis. In Ohio's STW frameworks specifically, students connect theory and practice by achieving high academic expectations while gaining career exposure via business and industry tours and career mentoring (National STW Information Learning Center, 2001).

Since the termination of STW federal funding, the state of Ohio and its local partners hope to achieve several STW objectives. These objectives consist of (a) promoting in-school curricular approaches that bring work and career issues in the classroom, (b) building connections through curriculum integration, contextual teaching and learning, work-based learning and internships, and (c) providing work-based strategies for increasing academic and occupational skills (School-to-Work Systems Integration Coalition, 1999).

To assist preservice teacher educators in preparing competent teachers, efforts to continue the STW mission must address Ohio's educational mission and guidelines for teacher education. Following the priorities of Ohio's Schools of the Future, teacher preparation must align with initiatives such as Standards for Ohio's Schools, Goals 2000, and STW—all of which maintain the goals of improving children's learning and seeking innovation in the teaching and learning process. School-to-work can provide a plan for organizing the academic and skill-based foci within formal educational environments and can provide the framework for preparing teachers who perform successfully within these environments. Further, STW focuses on principles of applied learning, which directly addresses Ohio's teaching priority that links knowing and doing. Additionally, STW addresses Ohio's priority to increase collaboration with other teachers and the business community, as well as the use of a variety of teaching methods to foster student success (School-to-Work Systems Integration Coalition, 1999).

Empirical research findings highlight the success of STW in regions throughout the country. Numerous studies indicated that students who participated in STW programs displayed higher academic achievement, lower dropout rates, and higher attendance and graduation rates than those who did not participate. Additionally, data in some areas of the country showed higher academic achievement in math and English, improved attendance rates, and higher college enrollment rates, particularly for students of color (Dembicki, 1998).

A notable STW success existed in the creation of numerous successful business partnerships between local school systems and the business community. The

success of these partnerships was evident in the high levels of support shown by members of the business community who tended to stay with STW programs even when the economy was struggling. The creation of successful business relationships, along with many other successes, appeared congruent in studies conducted throughout the country (Dembicki, 1998).

This study was spearheaded by a two-year STW project conducted by the Ohio State University of Education Deans, the Ohio Board of Regents, and the Ohio Department of Education, to encourage the integration of STW into preservice teacher education programs throughout the state. The first phase of the project, implemented in 1997, created a framework for integrating STW into the preservice curriculum for all new teachers in Ohio. The second phase of the project provided evidence of successful STW integration practices in preservice teacher education programs in Ohio. The objectives and results of the previous project provided groundwork for continuing STW research efforts in Ohio and paved the way for the current research endeavor—a continuation of the efforts of the earlier project.

To date, evidence of STW success has been primarily anecdotal with little hard data available to measure lasting change (Dembicki, 1998). For this reason, research that focuses on successfully preparing future teachers to utilize and apply STW within their classrooms may expand the current body of STW research. Further, because future teachers will be responsible for continuing STW practices now that the initiative no longer exists in its current form, it is important that they understand, utilize, and apply STW concepts within tomorrow's classrooms.

Ultimately, the successful preparation of future teachers lies in the hands of preservice teacher educators. To adequately prepare Ohio's future teachers for STW implementation, preservice teacher educators must possess knowledge of STW and display an ability to utilize and implement its components within teacher preparation courses. A determination of their current knowledge levels must first be ascertained and is necessary to create professional development activities that can be used to prepare preservice teacher educators for STW implementation. The purpose of the study was to determine the perceived knowledge level and utilization of school-to-work strategies among full-time, preservice teacher educators in colleges of education and to determine their perceived application of comprehensive school-to-work frameworks within teacher preparation programs. Three questions guided this study: 1. What do preservice teacher educators perceive as their knowledge level of school-to-work? 2. At what level do preservice teacher educators perceive they use school-to-work within teacher preparation courses? 3. To what extent do preservice teacher educators perceive they prepare preservice teachers to use school-to-work? Answers to these questions may serve as the basis for determining professional development needs among college of education

preservice teacher educators. From there, professional development opportunities can be provided to meet those needs.

Method

Participants

This descriptive study examined a population of full-time preservice teacher education faculty, teaching at least one professional education course required within a teacher education major at a publicly funded state university in Ohio. To identify members of the target population, a list of 13 state universities was obtained from the State University Education Deans (SUED), a voluntary association that has supported college of education STW initiatives for several years. Comprehensive lists of preservice teacher education faculty from the teaching specialties of early childhood education, career and technical education, multi-age education, intervention specialist education, and adolescent to young adult education, teaching no less than one course required within the teacher education major, were obtained from the Associate Dean of Academic Affairs, Deans or department chairs from Colleges of Education, or faculty members within the identified colleges. The final list consisted of 359 preservice teacher educators. All members were included in the target population.

Instrumentation

A review of the latest STW literature was conducted to assist with the development of a cross-sectional survey. Survey items originated from the national STW template. The template identifies the key components essential to a STW system (National STW Learning & Information Center, 1999). The national STW template consists of approximately 50 school-based, work-based, and connecting activities components that can be used to build a state STW system. The survey included 21 STW components that were pulled directly or condensed from components found on the national STW template. These 21 components were selected based on their direct application to postsecondary teacher preparation.

Each of the 21 STW survey components addressed school-based activities, work-based activities, or connecting activities. The instrument also included two open-ended questions to determine exposure to STW through previous professional development activities. Six demographic questions were also included so that further analysis could be used to identify potential relationships between the 21 STW components and teaching institutions, teaching specialties, years of experience, and genders of preservice teacher educators.

For each STW survey component, preservice teacher educators were asked to address the three following questions: (a) What is your perceived knowledge level of this STW concept? (Knowledge of STW), (b) How often do you use the concept in your own teaching? (Utilization of STW), and (c) To what extent do you prepare

students to utilize STW concepts? (Preparation for use of STW). These survey questions align with the major research questions in this study.

Respondents rated each component using a Likert scale with scores ranging from 1 to 5. A score of 5 indicated being very knowledgeable, frequently using, and extensively preparing students to use the various STW components. A score of 3 indicated being somewhat knowledgeable, occasionally using, or somewhat preparing students to use STW components. A score of 1 indicated having little knowledge, never using, or not preparing students to use the STW components. A numerical score of 2 and 4 did not include a specific scale description and were left to the interpretation of respondents.

A review team consisting of faculty who worked closely with STW in the state of Ohio and members of the granting agency who provided funding for the research reviewed the survey. The team reviewed the survey's content and provided suggestions regarding items to add, delete, or rearrange. The review process established the instrument's content-validity. The survey was pilot-tested by 26 preservice teacher educators who were also asked to react to the content and structure of the survey. Results from the pilot-test led to final revisions. Using the Cronbach alpha reliability coefficient, the internal reliability of the final instrument was calculated at .94.

Data Collection and Analysis

The cover letter and survey were mailed to all 359 preservice teacher educators identified at the participating universities. The survey contained a five-digit identification code that was used to assure confidentiality and to identify nonrespondents for follow-up activities.

The first mailing elicited response from 119 preservice teacher educators for a return rate of 33.0%. Four weeks later, a follow-up mailing was sent to all nonrespondents. The second survey mailing elicited a response from 26 additional preservice teacher educators. After removing nine incomplete surveys, 136 surveys were analyzed, resulting in a final response rate of 39.0%.

Because the desired percentage rate was not achieved from the first and second mailings, a survey of nonrespondents was conducted to determine if teacher educators who initially responded to the survey scored significantly different from nonrespondents. Wunsch (1986) cites a 10.0% response rate as "all that can be expected" (p. 33) when surveying nonrespondents. Accordingly, 10% of the nonrespondent population—22 preservice teacher educators—was surveyed by phone. To determine whether significant differences existed between initial respondents and nonrespondents *t*-tests were conducted. Results showed no significant differences between the mean scores of respondents and nonrespondents. Nonrespondent surveys were not used in the study.

Descriptive statistics, including mean and standard deviation scores, were calculated for the 21 STW components identified on the survey. I calculated

statistics to determine the perceived knowledge level, and utilization of STW components by preservice teacher educators, as well as the extent to which they prepared future teachers to use those components. Additional analysis was conducted to determine if preservice teacher educator demographics had any effect.

Findings

On the survey, data for each of the three research questions elicited mean scores on the 21 survey components. To clearly present the data, mean scores for each of the three research questions were averaged to obtain one averaged mean score for each of the 21 survey components. Table 1 presents the 21 components in ranked order from the highest to lowest average mean score.

The highest mean scores on the survey ranged between 4.00 and 5.00. According to faculty responses, the following STW components are within this category: (a) teaching to diversity, (b) collaborative/cooperative learning, (c) developmentally appropriate practices, (d) authentic assessment, and (e) education standards. Based on the perceptions of these preservice teacher educators, these are the STW components are those in which they were most knowledgeable, utilized the most, and prepared students to utilize the most.

The STW components for which preservice teacher educators perceived they were somewhat knowledgeable, occasionally utilized, and somewhat prepared students to utilize, produced mean scores from 3.00 to 3.99. These STW components were (a) contextual teaching and learning, (b) interdisciplinary teaching and learning, (c) project-based learning, (d) multiple intelligences, (e) problem-based learning, (f) self-regulated learning, (g) SCANS skills, and (h) team teaching with other faculty.

Several survey components elicited mean scores ranging between 2.00 and 2.99. These numerical scores fell within the categories of somewhat knowledgeable to unknowledgeable, occasionally utilizing to not utilizing, and somewhat preparing students to not preparing students to utilize STW components. The following STW components are included in this category: (a) service learning, (b) partnerships with business and other community organizations, (c) connecting school-based and work-based activities, (d) work-based learning, (e) collaborating with employers, (f) STW in general, and (g) STW resources. Teacher educators recognized, but were not familiar with these STW components.

The lowest mean scores for preservice teacher educators ranged between 1.00 and 1.99. The STW component in this range is entitled "Ohio's School-to-Work Initiative." Based on means, Ohio's preservice teacher educators felt they knew little, never utilized, and did not prepare students to utilize this STW component.

Data were further analyzed using one-way analysis of variance (ANOVA). An ANOVA test was conducted to determine if significant differences existed between several independent and dependent variables. Independent variables were gender,

TABLE 1
The perceived knowledge level, preparation, and utilization of school-to-work concepts by preservice teacher educators (N=136)

School-to-work concept	Average *M* for 3 questions *
1. Teaching to diversity	4.31
2. Collaborative/cooperative learning	4.18
3. Developmentally appropriate practices	4.15
4. Authentic assessment	4.02
5. Education standards	4.01
6. Contextual teaching and learning	3.86
7. Interdisciplinary teaching and learning	3.85
8. Project-based learning	3.80
9. Multiple intelligences	3.79
10. Problem-based learning	3.76
11. Self-regulated learning	3.59
12. SCANS skills	3.59
13. Team teaching with other faculty	3.49
14. Service learning	2.91
15. Partnerships with business and other community organizations	2.80
16. Connecting school-based and work-based activities	2.79
17. Work-based learning	2.71
18. Collaborating with employers	2.56
19. STW in general	2.49
20. STW resources	2.20
21. Ohio's STW initiative	1.99

Notes. Survey questions—What is your perceived knowledge level of this STW component? [5=Very knowledgeable, 3=Somewhat knowledgeable, 1=Not knowledgeable]. How often do you use the STW component in your own teaching? [5= Frequently, 3=Occasionally, 1=Never]. To what extent do you prepare students to utilize this STW component? [5=I extensively prepare students, 3=I somewhat prepare students, 1=I do not prepare students]. Likert-scale scores of 4 and 2 had no scale description and were left to the interpretation of the respondent.

years of experience, teaching institution, and teaching specialty. Dependent variables were responses to the three STW survey questions that sought information about preservice teacher educators' knowledge of STW, utilization of STW, and preparation to use STW. Table 2 shows ANOVA results.

TABLE 2
Analysis of variance results

Independent variables		Knowledge of STW		Utilization of STW		Preparation to use STW	
	df	*F*	*p*	*F*	*p*	*F*	*p*
Gender	6	0.02	.90	0.01	.94	0.33	.57
Years experience	6	0.87	.49	0.95	.44	1.06	.38
Teaching institution	6	0.63	.78	0.89	.55	1.13	.35
Teaching specialty	6	2.38	.04*	2.02	.08	1.93	.10

*$p < .05$

Analysis of variance produced no significant differences within the gender, years of experience, and teaching institution variables for each of the three survey questions. The test also did not detect significant differences within the teaching specialty variable as it related to the two survey questions that focused on utilization of STW and preparation of students to utilize STW. However, the test detected a pattern of significant difference within the teaching specialty variable for the survey question addressing the knowledge of STW.

Post hoc tests were conducted to locate where significant differences existed within the teaching specialty variable. Using Tukey's studentized range test and a *t*-test comparison of means, knowledge of STW scores were significantly different for faculty in career and technical education and multi-age teaching specialties. Career and technical education teachers' scores were significantly different from teachers within the specialties of early childhood education, adolescent to young adult education, and intervention specialist education. Additionally, faculty within multi-aged education scored significantly different from faculty within the intervention specialist education teaching specialty (see Table 3).

Data were also analyzed to determine preservice teacher educators' previous training with STW concepts. Preservice teacher educators were asked, "Have you received previous training for implementing STW concepts?" Thirty-six educators responded yes to the survey item, 101 responded no. Scores were then compared using analysis of variance.

The scores of preservice teacher educators who responded yes to the items scored significantly different (at the $p<.01$ level)on all three questions—knowledge of STW, $F(3, 133=18.74$; utilization of STW, $F(3,133)=11.60$; and preparation of students to utilize STW, $F(3,133)=10.73$—than preservice teacher educators who responded no to survey items.

What is significant is that the survey findings showed that more preservice teacher educators from the career and technical education teaching specialty had

received previous STW training than did preservice teacher educators from other teaching specialties. This may be an indication of why results showed they were more versed on STW concepts than educators from other teaching specialties.

TABLE 3
General linear models procedure: t-test comparison of means for survey area entitled "Knowledge of STW"

Teaching specialty area comparison	Lower confidence limit	Difference between means	Upper confidence limit
Vocational—Early childhood	0.086	1.30	2.509*
Vocational—Adolescent to young adult	0.307	1.49	2.663*
Vocational—Intervention specialist	0.382	1.60	2.817*
Multi-age—Intervention specialist	.011	0.55	1.087*

Notes. Comparisons significant at the 0.05 level. This comparison controls for Type I comparison-wise error rate not experiment-wise error rate. Confidence=0.95, *df*=6.

Conclusions

The Ohio preservice teacher educators in this study were most knowledgeable in areas that closely associated with academics, instructional pedagogy and theory, and state and national educational agendas. High mean scores on STW survey components such as teaching to diversity, interdisciplinary teaching/learning, education standards, and developmentally appropriate practices, suggest that educators are aware of the educational trends inherent within university environments today. Additionally, because these topics have been highly publicized in educational publications and in the media, they served as the focus of professional development activities at the university level.

Relatively high means scores for the contextual teaching and learning and authentic assessment survey components and average scores for project-based, problem-based, and self-regulated learning components suggest that preservice teacher educators are very familiar with contextual teaching and learning and somewhat familiar with associated concepts. This finding may be attributable to the state and national focus, and the positive national reception of contextual teaching and learning and associated concepts. Findings also suggest that preservice teacher educators have been provided with some professional development activity and resources that familiarize them with these concepts, but may not have necessarily been prepared to implement them within their teacher education programs.

Ohio's preservice teacher educators were less knowledgeable of, less likely to utilize, and less likely to prepare students to utilize the work-based and connecting components of STW. This is evident from their indicated lack of knowledge of STW components such as work-based learning, connecting school-based and work-

based activities, and school-to-work resources. Additionally, they indicated that they did not apply these concepts within their own classrooms. Typically, teachers outside of the teaching concentration of career and technical education do not work closely with work-based education. Because of an inconsistent association with these concepts, they are simply not a focus of the professional development activities that are provided for preservice teacher educators within these areas.

It is important to stress the low mean scores that were obtained for the survey components focusing on employer collaboration and business and community partnerships. These survey components serve as major connecting activities of STW. Ironically, previous research indicated that partnerships between school districts and business industries were one of the strongest aspects of STW and provided one of its most positive outcomes (Dembicki, 1998). It is likely that Ohio's preservice teacher educators who are not involved in career and technical education do not understand the powerful learning opportunities that business collaborations can provide for students. It is also likely that educators have not received training that would assist them in establishing successful collaborations and effectively integrating them into courses that prepare future teachers.

Career and technical educators' mean scores indicated a higher knowledge level of the work-based, connecting, and structural components of STW than did the scores of preservice teacher educators in other teaching specialties throughout Ohio. Additionally, career and technical educators indicated more than other educators that they had received some STW training. This denotes the work force preparation emphasis that is prevalent in the career and technical teaching concentration and highlights the importance career and technical educators place on adequately preparing students to successfully enter the world of work.

Overall, Ohio's preservice teacher educators appeared to be the least knowledgeable of the structural components of STW. Furthermore, they seemed to know little about the national School-to-Work initiative and STW resources. Ultimately, they knew least about Ohio's School-to-Work initiative. It is evident that preservice teacher educators in Ohio are unfamiliar with the structural components of school-to-work and unaware of the focus of Ohio's School-to-Work initiative and mission. Although they have heard of the concepts and mission, they are unfamiliar with their meaning, as well as what the concepts entail.

Summary, Implications, and Recommendations

Ohio's preservice teacher educators involved in this research endeavor indicated that they are very knowledgeable of the academic, school-based, and contextual teaching and learning components of STW. A focus on these STW aspects has proven successful in educating youngsters throughout the country and should continue to be a focus of professional development activity. Because Ohio's preservice teacher educators are less familiar with the structural components, the

work-based components, and the connecting activities of STW, these areas warrant professional development focus.

Without first addressing Ohio's STW mission and clearly identifying how that mission fits into teacher preparation, professional development activities that focus on STW may be futile. Career and technical educators hold a key to continuing Ohio's STW mission and can not only spread the knowledge of that mission, but can also communicate the valuable concepts that help improve teacher education programs. Based on the emphasis that is placed on achieving Ohio's mission through professional development, it is imperative that those career and technical educators who are involved in professional development activity assist preservice teacher educators in developing a working knowledge of the STW initiatives that have proven successful, as well as those that can be used to prepare future teachers.

Professional development activity must then focus on specific methods for integrating STW concepts into the teacher education curriculum. This means specific instruction for integrating the successful aspects of STW into the teaching specialties at each university. There should be an additional connection showing educators how STW components can assist students with academic achievement and with passing Ohio's proficiency tests.

With society's need to adequately prepare students to successfully enter and thrive in the 21st century work force, methods for articulating links between school and work should be emphasized in professional development. Ohio's preservice teacher educators should be instructed on new models for preparing future teachers to educate their students using a workforce integration emphasis. Additionally, professional development activities should focus on developing and utilizing collaboration and community partnerships. Although collaboration means different things to different educators, educators should at least be aware of the valuable educational tools that outside resources can provide and should know how to effectively use community partnerships and collaboration as a context for enhancing the learning environment of all students.

Although funding has ended, STW will continue in other forms. Future national and state STW structures should be clearly delineated and presented to all teacher educators responsible for preparing teachers. Professional development should be used to educate preservice teacher educators within colleges of education regarding STW structure, work-based components, and connecting activities.

References

Bruner, J. (1966). *Toward a theory of instruction.* Cambridge, MA: Harvard University Press.

Center for the Teaching Profession. (2001, February 1). *Mission statement from the Office of Educators Preparation.* Ohio Department of Education.

Berns, R. (1997). A framework for integrating School-to-Work into pre-service teacher education programs. Bowling Green State University, State University Education Deans.

Dembicki, M. (1998). Mid-term review. *Techniques, 73*(8), 18-21.

Dembicki, M. (1998). Interview with Stephanie Powers. *Techniques, 78*(8), 28-30.

Dewey, J. (1941). *The world's great thinkers: The social philosophers.* New York: Random House.

Gardner, H. (1983). *Frames of mind: The theory of multiple intelligence.* New York: Basic Books.

Hettinger, J. (1998). The buck stops soon. *Techniques, 73*(8), 22-24.

Educator's Resource Center. *Characteristics of a high-quality teacher preparation program*. National Commission on Teaching and America's Future.

National School-to-Work Learning & Information Center. (1999). *School-to-work* [Fact Sheet]. Retrieved from http://stw.ed.gov/general/whatis.htm

National School-to-Work Learning and Information Center. (2001). *OHIO School-to-Work Opportunities–1999 profile.* Retrieved from http://stw.ed.gov/general/ohiostw.htm

National School-to-Work Learning & Information Center. (2001). *School-to-Work template*. Retrieved from http://www.stw.ed.gov/factsht/templtoc.htm

O'Conner, P. (1998). *Integrating school-to-work principles in teacher education programs at Kent State University.* Kent State University, State University Education Deans.

Parnell, D. (1995). *Why do I have to learn this?* Waco, TX: Cord.

School-to-Work Systems Integration Coalition, Preservice teacher education framework project. (1999). *A framework for integrating school-to-work into preservice teacher education programs.* Columbus, OH: Author.

Wunsch, K. R. (1986, February). Action research in business education. *Forum Feature,* pp. 31-34.

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Journal of Vocational Education Research, 27(2), pp. 257-274.

Using Structural Equation Modeling to Improve Research in Career and Technical Education

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Abstract

This paper describes structural equation modeling (SEM) and possibilities for using SEM to address problems specific to workforce education and career development. A sample of adolescents identified as work-bound (i.e., transition directly from secondary school to work) from the National Education Longitudinal Study 1988-1996 database (NELS: 88-94, 1996)[1] was selected for illustrative purposes. The authors urge greater use of sophisticated analytic techniques like SEM in career and technical research to more adequately consider the complexity of work-based issues and problems.

The use of structural equation modeling (SEM) to examine complex questions in education and the social sciences has seen substantial growth in popularity over the past decade. The increase in use can be attributed to a number of things including a greater flexibility in representing relationships among theoretical constructs, ability to posit latent constructs presumed to be underlying causes of observed manifest variables, and ease in evaluating the general compatibility or "goodness of fit" of a proposed model for the data being examined and the strength of relationships among constructs (Quintana & Maxwell, 1999).

Covariance structural modeling, another term for SEM, integrates the best of several analyses including multiple regression (directional relationships between a set of predictor variables and a dependent [or criterion] variable), path analysis (tests for theoretical relationships among independent and dependent variables, and the direct and indirect effects of independent variables on dependent ones), and factor analysis (determining which variables have common variance–covariance characteristics with a latent variable of construct (Breckler, 1990; Kunnan, 1998). SEM procedures emphasize covariances rather than cases, and attempt to minimize the difference between sample covariances and covariances predicted by the model (Bollen, 1989).[2]

Although the family of statistical analyses based on SEM have been applied to numerous empirical investigations in education and the social sciences, scholars in career and technical education have been somewhat slow to adopt the techniques for their research. Rojewski (1997b) reported that in the 10-year period, 1987-1996,

only two articles (1.9%) published in the Journal of Vocational Education Research used SEM. The low level of interest in SEM is probably due to a host of factors, the chief ones likely being a lack of pedagogic instruction on SEM and related topics, few quality examples of SEM application to issues of concern to the field, little discussion of the merits and limitation of SEM among scholars in career and technical education (Kunnan, 1998), and the limited use of theory guiding career and technical education research (Rojewski, 1999).

Therefore, this paper introduces the general uses of SEM and reviews its potential application in career and technical education research. We illustrate the principles of SEM using an issue of some importance to career and technical educators: the development and implementation of career aspirations espoused by work-bound youth. Occupational aspiration and its role in career choice have stimulated a considerable amount of empirical research focusing on wide-ranging topics such as the role of aspirations in career compromise and comprehension (Lapan & Jingeleski, 1992; Leung, 1993; Leung & Plake, 1990), the effectiveness of early aspirations in predicting career choice and attainment (Holland, Gottfredson, & Baker, 1990), the influence of aspirations on pursuit of educational and occupational opportunities (Lent, Brown, & Hackett, 1996), and the impact that factors like gender have on aspirations (Davey & Stoppard, 1993). While substantial progress has been made in establishing the nature and determinants of occupational aspirations, much remains to be examined about the possible antecedents of aspirations and their role in career behavior (Osipow & Fitzgerald, 1996), especially for adolescents who will transition directly from secondary school to work.

What is Structural Equation Modeling?

Bollen (1989) offers the fundamental hypothesis for structural equation modeling:

$$\Sigma = \Sigma(\Theta)$$

Where Σ (sigma) is the population covariance matrix of observed variables, Θ (theta) is a vector of model parameters, and $\Sigma(\Theta)$ is the covariance matrix implied by the model. When the equality expression in the equation holds, the model is said to "fit" the data. However, it is highly unlikely that a perfect fit will exist between the observed data and the hypothesized model, and there will necessarily be a discrepancy, which is termed the residual, between the two. Bryne (1998) therefore summarized the model-fitting process as:

$$\text{Data} = \text{Model} + \text{Residual}$$

Data represents score measurements related to the observed variables as derived from persons comprising the sample. Model represents the hypothesized structure linking the observed variables to the latent variables, and in some models, linking particular latent variables to one another. Residual represents the discrepancy between the hypothesized model and the observed data.

Typically, a researcher postulates a statistical model based on his or her theoretical knowledge, on empirical research related to the study, or some combination of both (Pedhazur, 1997). Once specified, the plausibility of the model is tested using a computer program, e.g., LISREL (Linear Structural Relations Analysis), based on sample data comprising all observed variables in the model.

In LISREL, a computer program that performs SEM[3] (Joreskog & Sorbom, 1996), exogenous variables are designated as ξ (xi) and endogenous variables are designated as η (eta). Exogenous variables, which are used as predictor or independent variables, are considered to be the starting points of the model, and endogenous variables may serve as both predictors and criteria, being predicted by exogenous variables and predicting other endogenous variables. The model in SEM has two basic components: the measurement model, which defined hypothetical latent variables in terms of observed measured variables, and the structural model, which defines relations among the latent variables (Breckler, 1990).

Measurement Model

SEM is a powerful analytic procedure that allows examination of fairly complex theoretical models or patterns of relationships among latent variables.[4] This is accomplished through the simultaneous specification and analysis of measurement and structural equation models. A measurement model is concerned with relationships between one or more observed (measured) variables, such as scores from rating scales or questionnaire items, and a latent (unobserved or hypothetical) variable. Typically, confirmatory factor analysis is used to define underlying or latent constructs represented by observed (measured) variables. Construction of a measurement model follows the general logic of factor analysis where multiple measures of a theoretical domain are obtained and specific components of each measure related to the latent variable is extracted (Bollen, 1989; Joreskog & Sorbom, 1989; Moore, 1995).

To develop a measurement model, the range of theoretical constructs included in the model and the way constructs will be measured must be considered (Quintana & Maxwell, 1999). For our example, we are interested in the stability or volatility of aspirations espoused by work-bound youth from the 8th to 10th grades (Rojewski, 1997a). While illustrative, this example is relevant to those in career and technical education since developmental theory (Super, 1990, Super, Savickas, & Super, 1996) suggests that early adolescence is a time when individuals are increasingly aware and beginning to think about exploring various career-related opportunities. The more unstable adolescents' aspirations are, the less likely they are to make sound decisions regarding curriculum and other educationally-related issues.

Adolescents who are ambivalent or undecided about their occupational futures, as well as those with lower-prestige aspirations, may be less likely to enroll or persist in prerequisite academic courses in middle school, which may preclude their

enrolling in more advanced courses in high school. This in turn, reduces the likelihood of pursuing postsecondary education and diminishes opportunities for attaining higher-prestige occupations. (Rojewski, 1997a)

To construct our measurement model we chose two observed or measured variables—occupational aspirations and educational aspirations—to represent our unobserved dependent variables, postsecondary aspiration at Grade 8 and 10. Occupational aspiration was measured by participants' declaration of the occupation they expected or planned to have at 30 years of age from a listing of 17 separate occupations. These 17 occupations were organized into high, medium, and low prestige categorizes using socio-economic index codes that reflected perceived prestige levels and required education (Stevens & Cho, 1985). Educational aspirations were determined by asking adolescents to denote the highest level of education they thought they would achieve. Educational aspiration was conceptualized as an interval-level construct (Haller & Virkler, 1993) with a low score of 1 representing aspirations for high school and a high score of 6 representing aspirations for a PhD, MD, or equivalent. Figure 1 illustrates part of the measurement model. An identical model was also developed for examining postsecondary aspirations in Grade 10.

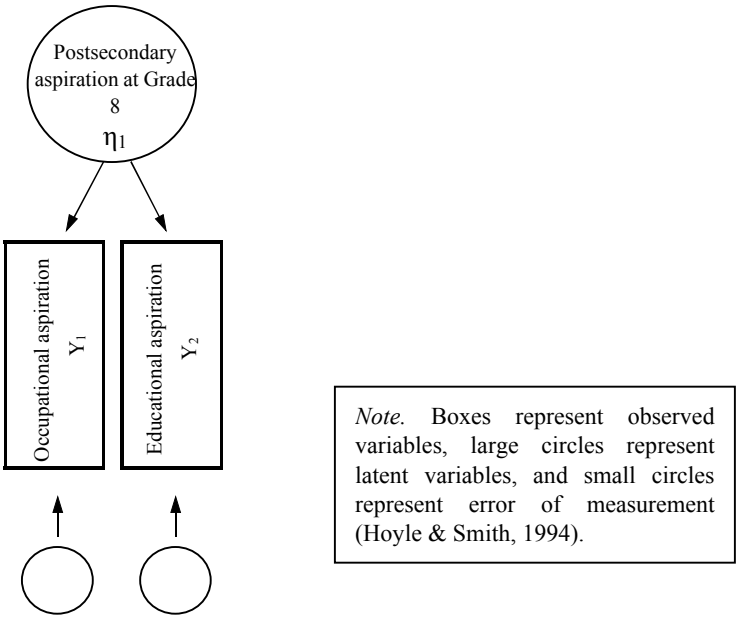


FIGURE 1. *Example of a measurement model used in SEM.*

Structural Model

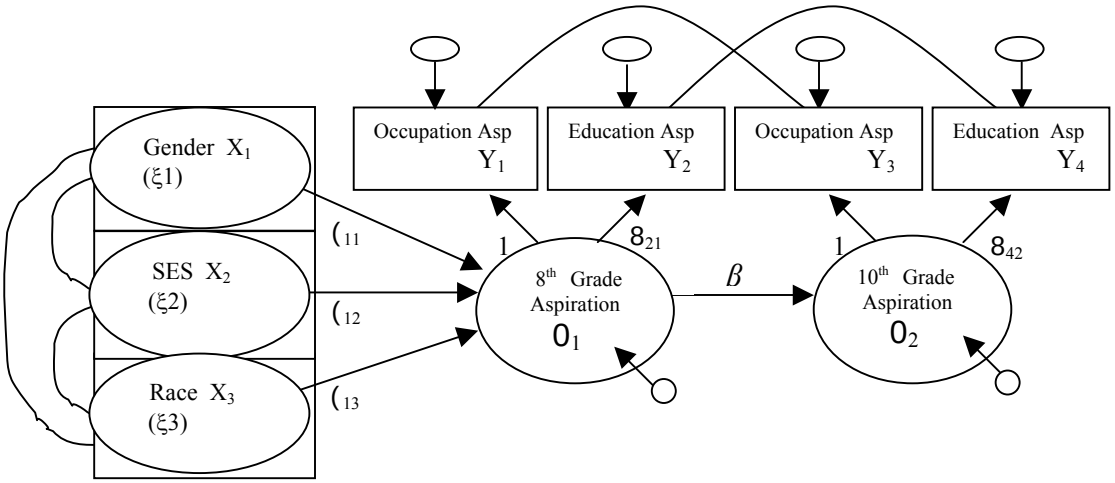
The structural model is that part of structural equation modeling concerned with the relationships among the unobserved (latent) variables. Typically, the structural portion of the model simultaneously tests the effects of latent variables on each other (Buczynski, 1994). A regression equation represents the simplest structural model where an observed independent variable influences an observed dependent variable (Keith, 1993). While the general use of SEM involves both a measurement model and a structural model that tests latent (unobserved) variables (Fassinger, 1987), SEM can also be used without latent variables and is similar to analysis of variance or multiple regression where all possible paths are examined (Bollen, 1989; Hoyle & Smith, 1994; Joreskog & Sorbom, 1989; Moore, 1995).

When designing a structural path model, several decisions must be made including (a) determining which latent (and observed) variables should be included in the model, and (b) specifying the paths of influence that should be examined. The first step is to specify a model which visually represents the hypothesized relationships of interest. Because of the potential complexity involved in specifying a structural model, researchers must rely on a strong theoretical basis, prior research, actual or logical time antecedent and precedents (Rojewski, 1996). Typically, structural equation modeling will illustrate the relationships between observed variables and the latent variables they are hypothesized to represent (i.e., the measurement model), and the relationships between the latent variables (i.e., the structural model).

Figure 2 portrays the complete structural equation model we developed to examine the stability of postschool aspirations of work-bound adolescents. In terms of model notation, the symbol X denotes a pseudo-exogenous (ξ) variable, a variable that is not dependent on other variables within this model. The symbol Y denotes an endogenous variable which is dependent on one or more other variables in the model. Endogenous variables are the target of at least one one-headed arrow in any structural model.

Variable Specification

Information about gender, race/ethnicity, and socioeconomic status (SES) was collected from students' first follow-up questionnaires completed during Grade 10. Students were asked to indicate their racial/ethnic origins from predeveloped categories that were recoded for analytic purposes into White and nonWhite. This decision was based on a view that variables like race/ethnicity are stimulus variables that cause societal reaction such as bias or discrimination. We reasoned that regardless of specific group affiliation, individuals of minority status are more likely to share certain experiences and environmental barriers to educational and career attainment (Osipow & Fitzgerald, 1996). Treating race as a dichotomous variable also facilitated the causal modeling analysis.



Note. The circle within the rectangle represents pseudo-exogenous variables.[5]

FIGURE 2. *Model for testing relationships among occupational aspirations of work-bound youth from Grades 8 to 10.*

Occupational aspirations were assessed in grades 8 and 10 by asking adolescents to indicate the job or occupation they expected to have at age 30 from a listing of 17 distinct occupational categories used extensively by the U.S. government in census and survey work. Occupational aspirations were coded using the socioeconomic index (SEI) codes calculated by Stevens and Cho (1985). Since the 4-digit SEI codes reflect income, social status expectations, and educational attributes of occupations, they allow differentiation between occupations along a socioeconomic hierarchy, providing a continuous rather than categorical variable (Hotchkiss & Borow, 1996). Educational aspiration was coded on a 6-point Likert-type scale from high school to doctoral program.

Data Analysis

We used a latent variable modeling technique called multiple indicators, multiple causes (MIMIC), which is one of several structural equation models available on LISREL 8.14 software (Joreskog & Sorbom, 1993). MIMIC models (Joreskog & Goldberger, 1975) are a specific type of latent variable analysis that contains one or more latent variables that are simultaneously identified by both multiple endogenous item indicators (items that compose the measure under consideration) and by multiple exogenous causal variables (background variables such as demographics).

Figure 2 contains the MIMIC model of career aspirations employed in our analysis. Exogenous variables include gender, SES, and race. These are used like pseudo-exogenous latent variables in this MIMIC model. That is, X is a perfect measure of ξ and that only one latent variable, η_1 is present. The η_1 is directly affected by one or more X variables, and it is indicated by one or more Y variables. Latent endogenous variables (η) are represented by occupational aspirations educational aspirations. The structural model relating exogenous (X) and endogenous (Y) variables consists of ((gamma, structural coefficients relating X to Y variables) and $ (beta, structural coefficients relating Y to Y variables) matrices. We let the measurement error of the indicators between Grades 8 and 10 correlate since the same measures are repeated over time resulting in a tendency for measurement errors to correlate over time due to memory or other retest effects (Joreskog & Sorbom, 1996).

A two-factor measurement model (8th and 10th grades), including the direct effects of exogenous variables—gender, SES, and race—on latent variables representing 8th and 10th grade aspirations, was estimated for work–bound adolescents. The model was estimated on the covariance matrix with maximum likelihood estimation and was identified by the MIMIC rule outlined by Bollen (1989); when the number of Ys (endogenous indicators) is two or greater and the number of Xs (exogenous variables) is one or more then a sufficient condition exists for identification. The equations for the MIMIC model are: $\eta = \$_\eta + \Gamma x + \zeta$; $y = \Lambda_y \eta + \varepsilon$; and $x = \xi$. In the equations, η is the vector of latent endogenous random variables; ξ is

the latent exogenous random variables; $ is a coefficient showing the influence of the latent endogenous variables on each other; Γ is a coefficient for the effects of ξ on η; ζ is the disturbance vector that is assumed to have an expected value of zero and which is uncorrelated with ξ; y and x vectors are observed variables; Λ is a coefficient that shows the relation of y to η; ε is the error of measurement for y.

Two variables—occupational aspiration and educational aspiration at grades 8 and 10, respectively—were used as indicators of adolescents' postsecondary career aspiration. Background variables were respondents' gender, socioeconomic status, and race. Female students were slightly more likely to report higher aspirations than male students ((= .139); nonwhite students were slightly more likely to report higher aspiration than white students ((= -.156). However, socioeconomic status (SES) had considerable influence on reporting their transition status ((= .424) supporting Super's (1990) explanation that SES influences career decision-making and attainment by opening or closing opportunities, and shaping occupational concept. The sample correlation matrices of the seven observed variables is given in Table 1 for work–bound youth, while descriptive statistics represented by male and female groups are displayed in Table 2.

TABLE 1
Pearson correlations for observed variables in work-bound adolescents

Variable	X1	X2	X3	Y1	Y2	Y3	Y4	Mean	SD
Gender [X1]	1.00							1.47	.50
Socioeconomic status [X2]	–.027	1.00						2.06	.99
Race [X3]	–.016	.178	1.00					1.70	.46
Occupational aspirations (Grade 8) [Y1]	.101	.098	–.060	1.00				35.38	11.65
Educational aspirations (Grade 8) [Y2]	.151	.142	–.058	.217	1.00			43.69	16.28
Occupational aspirations (Grade 10) [Y3]	.066	.283	–.066	.294	.282	1.00		4.10	1.36
Educational aspirations (Grade 10) [Y4]	.095	.284	-.037	.235	.420	.481	1.00	3.84	1.39

Notes. N = 4,828 calculated listwise; gender (1=male, 2=female); SES reflects status in 8th grade and is based on a composite score of five variables (standardized scores, M=0.00, SD=1.00) originally designed by NELS researchers including family income, parents' education levels, and parent's occupations (Owings et al., 1994); race (1=nonwhite, 2=white); occupational aspiration is a self-report value converted to socioeconomic index codes (Stevens & Cho, 1985); educational aspiration is coded on a 6-point Likert-type scale calculated listwise.

TABLE 2
Descriptive statistics of work-bound adolescents by gender

	Male adolescents[a]		Female adolescents[b]	
	M	*SD*	*M*	*SD*
Socioeconomic status	2.08	1.00	2.03	.99
Race	1.71	.45	1.69	.50
Occupational aspiration (Grade 8)	34.28	10.48	36.64	10.49
Occupational aspiration (Grade 10)	41.38	15.34	46.31	14.65
Educational aspiration (Grade 8)	4.02	1.36	4.20	1.55
Educational aspiration (Grade 10)	3.72	1.38	3.98	1.56

Notes. *N* is calculated listwise; gender (1=male, 2=female); socioeconomic status reflects status in 8th grade and is based on a composite score of five variables (standardized scores, *M*=0.00, SD=1.00) originally designed by NELS researchers including family income, parents' education levels, and parent's occupations (Owings et al., 1994); race (1=nonwhite, 2=white); occupational aspiration is a self-report value converted to socioeconomic index codes (Stevens & Cho, 1985); educational aspiration is coded on a 6-point Likert-type scale calculated listwise.

[a]Male adolescents, *n*=2,563. [b]Female adolescents=2,265.

The MIMIC identification rule requires a scale be assigned to latent variables for identification. This was done by scaling one factor loading in each latent variable to unity with its item (i.e., fixing the factor loading to 1.00). Occupational aspirations for each latent factor were scaled to 1.0 since each was the first item in the respective latent factor. In addition, we incorporated the assumption that unstandardized regressions of observed measures on constructs (so-called "factor loadings") are equal at each point in time for each indicator of aspiration. In Figure 2 this means constraining $8_{2\,1} = 8_{4\,2}$ (educational aspirations at Grades 8 and 10, respectively). The regression weight 8 states the relationship between the unit of measurement of the observed variable and construct (Joreskog & Sorbom, 1993). The equality assumption has a specific empirical interpretation: for a given aspiration true score η_1, a unit change in aspiration will produce the same amount of change in $8_{2\,1}$ and $8_{4\,2}$. This amounts to specifying that each of the measures of aspiration is the "same" across time. We include this set of restrictions in order to emphasize that we feel successive applications of the same measure is tapping the same construct. These restrictions are not necessary for identification and are testable by the chi-square test in the case of multiple indicators. Although we restricted these loadings to be equal, the true score variances, the measurement errors—and thus, the reliabilities—can vary over time (Wheaton, Muthen, Alwin, & Summers, 1977).

Results and Discussions

The chi-square test for the model was statistically significant, X^2 (9) = 163.968, p < .01, indicating a good fit between the model and data. However, several researchers (Bollen, 1989; Bollen & Long, 1993; Joreskog & Sorbom, 1989; Marsh, Balla, & MacDonald, 1988) have noted that the chi-square statistic is influenced by a large sample size (for this data set N = 4,828). In fact, Joreskog and Sorbom (1996) proposed that X^2 be used as badness rather than a goodness-of-fit measure in the sense that a small X^2 value (relative to its degrees of freedom) is indicative of good fit, whereas a large X^2 value reflects bad fit in SEM (Byrne, 1998). In light of problems associated with the X^2 statistic, we examined other fit indices which also provided evidence of an acceptable data fit including GFI = .991, AGFI = .971, NFI = .957, NNFI = .904, and RMSEA = .0597.[6] These indices except RMSEA range from 0.00 to 1.00, with values close to 1.00 being indicative of good fit. According to Steiger (1990), the RMSEA (Root Mean Square Error of Approximation) has only recently been recognized as one of the most informative criteria in covariance structure modeling, and it takes into account the error of approximation in the population and asks the question, "How well would the model fit the population covariance matrix if it were available?" (Browne & Cudeck, 1993, pp. 137-138). This discrepancy measured by the RMSEA indicates that values less than .05 indicate good fit, values as high as .08 represent reasonable errors of approximation in the population, values from .08 to .10 indicate mediocre fit, and those greater than .10 indicate poor fit (MacCallum, Browne, & Sugawara, 1996). Based on these goodness-of-fit statistics, we conclude that our hypothesized aspiration transition model for work-bound youth fits the sample date fairly well.

We examined the maximum likelihood estimation as implemented in LISREL VIII (Joreskog & Sorbom, 1996) for the model (see Table 3). The aspirations of work-bound youths were much more likely to remain stable ($=.743), and educational aspiration was a more reliable measure of the youth's postsecondary status than occupational aspiration. In order to clarify the relationship between manifest variables i.e. educational and occupational aspiration in the model and their corresponding latent constructs i.e., aspiration, factor loadings were examined. While the factor loading values of educational aspiration in both Grades 8 and 10 were statistically significant and consistent throughout the two grades (.700 and .926 respectively), the same loading values of an occupational aspiration (.422 and .427 for G.8 and G.10 respectively) were less than .50. That is, the measures did not uniformly contribute to their respective latent constructs, aspiration. Measures of educational aspirations had consistently higher loadings than measures of occupational aspirations. This suggests that the measure used for educational aspiration was a more reliable indicator of the young adolescents' aspiration construct than the occupational aspiration measure. However, we can also pull out the possibility that these work-bound students are facing uncertain passages and

detours in forming their occupational aspiration in transition from school to work. That is, it indicates that these students are unpredictable and volatile in forming their future occupation. Another possibility we can pull out from the value of factor loading is the measure of choice of occupations is too broad for these adolescents to choose. We used the SEI codes to form the items. While the variability of the item makes the validity of the item increase, the reliability might be reduced for the same reason. This information can also be examined from the squared multiple correlation (R^2), parameter values for educational aspirations (.489 and .857 for 8th and 10th grade respectively), explained substantial amounts of item variance compared to the value of occupational aspiration (.178 and .182 for 8th and 10th grade respectively). R^2 can range from 0.00 to 1.00, and serve as reliability indicators of the extent to which each adequately measures its respective underlying construct (Bollen, 1989), aspiration in this study.

TABLE 3
Maximum Likelihood estimates for model

Parameter	US	SE	*SS*	R^2
Lamda (8) 1 1	1.000		.422	.178
Lamda (8) 2 1	.189	.012	.700	.489
Lamda (8) 3 2	1.000		.427	.182
Lamda (8) 4 2	.189	.012	.926	.857
Beta ($) 2 1	1.019	.037	.743	
Gamma (() 1 1	1.392	.180	.139	
Gamma (() 1 2	2.135	.144	.424	
Gamma (() 1 3	–1.691	.202	–.156	

Notes. US denotes the unstandardized solution; SE denotes standard error; SS denotes the standardized solution; R^2 equals scale reliability; t_{values}= US/SE

Table 3 also shows the model parameter value for work-bound adolescents based on unstandardized and standardized solutions from the LISREL output. According to Saris and Stronkhorst (1984), the advantage of the unstandardized solution is that the effects of different variables can be obtained in the original measurement units. The disadvantage of unstandardized solutions is the complication they present when trying to compare the sizes of the coefficients when computing for variables which have been expressed in different measurement units. If one wants to make such comparisons, the standardized solution has certain advantages, since all variables are expressed in the same units (standard deviations), and the effects indicate the change in the effect variable, expressed in standard deviations, caused by a change of one standard deviation in the causal variable,

thereby keeping all the other variables in the equation constant. On the basis of this interpretation, the coefficients for each parameter value in Table 3 may be compared.

Implications for Practice

SEM can be utilized very effectively to address numerous research problems including nonexperimental research, and thus has become a popular methodology (Bryne, 1998). Fornell (1982) stated that several desirable characteristics of SEM set it apart from the older generation of multivariate procedures. First, SEM takes a confirmatory approach to the data analysis rather than an exploratory analysis, and it lends itself well to the analysis of data for inferential purposes by demanding that the pattern of intervariable relations be specified a priori. Second, SEM provides explicit estimates of either assessing or even correcting for measurement error while traditional multivariate procedures are incapable of these aspects. Finally, data analyses using SEM can incorporate both unobserved and observed variables while the analyses using the traditional multivariate methods are based on observed measurements only.

However, Breckler (1990) warned that serious problems are also associated with SEM although the method can be useful in making sense of complex interrelations in multivariate data sets. These are (a) potential violations of distributional assumptions, (b) failure to recognize the existence of equivalent models, (c) use of the same data to both derive and confirm models, (d) modification of models without cross-validation, and (e) poorly justified causal inferences. In addition to these problems, Breckler emphasized the importance of reporting the modification history since it may be difficult to know how many changes were made to an initial model. Therefore, Breckler recommended the following for detecting some deficiency in applications of structural equation modeling. First, the data should be inspected for potential violations of the multivariate normality assumption. Distributional assumptions are likely to be violated when variables are highly skewed or when extreme outliers are present. Second, authors must make every effort to identify equivalent models and to discuss whether such models offer plausible representations of the data (see MacCallum, Wegener, Uchino, & Fabrigar, 1993 for issues on equivalent model). Third, cross-validation should be conducted whenever an initial model is modified on the basis of the data (see Cudeck & Browne, 1983). Fourth, published accounts of covariance structure modeling should provide enough details of the analysis to permit replication by other investigators since unless all of a model's free parameters are clearly defined, the reader has no idea of knowing the precise model being fit. And last, whenever feasible, the data i.e., correlations or covariances should be provided as part of the published report so that other investigators may replicate the analysis and fit rival models to the data.

In this article, we promoted the use of structural equation modeling (SEM) in career and technical education research. Perhaps the most important outcome of this

study was the knowledge that occupational aspirations established by Grade 8 were relatively stable for the young adolescents. Examination of the potential for systemic bias to influence the aspirations of young adolescents, particularly those of a lower social class, might be another way for educators and counselors to address the impact of SES and gender on lowered occupational aspirations. While classroom-based interventions cannot eliminate the negative effects of low SES, professionals might seriously consider their expectations, biases, and preconceived ideas about the employment potential of individuals from lower social class backgrounds and examine how these perceptions might affect the delivery of intervention programs to these individuals (Rojewski & Yang, 1997). Further, it is necessary to understand the potential of early and sustained school-based career interventions for enhancing career development. Paying attention to the potential of SEM in career and technical education research, and the extent to which educational pathways in the labor market provide career guidance may help us to understand the paradigm of school to work transition, since the SEM techniques allow for the specification and testing of complex "path" models that incorporate sophisticated understanding (Kelloway, 1998).

Summary

In this article we have attempted to make researchers in career and technical education aware of the usefulness of SEM by elaborating work-based issues and problems. There is no doubt that the structural equation modeling might be a great analytic tool in the career and technical education area with a variety of useful applications when used in suitable contexts, and with appropriate cautions. However we need to keep in mind Joreskog's (1993) argument that testing structural equation modeling should be regarded as a way of testing a specified theory about relationships between theoretical constructs. Browne and Cudeck (1993), also, advised that the assessment of fit in SEM be made with careful subjective judgement based on what is already known about the substantive area and the quality of the data. What we mean by this is that researchers need to have solid theoretical background and knowledge when they attempt to apply the SEM technique to their research. Therefore, we argue again, as in all statistical analysis, that knowing the data and the sample both empirically and conceptually might be the best way to detect problems in analyzing given data.

References

Bollen, K. A. (1989). *Structural equations with latent variables*. New York: John Wiley & Sons.

Bollen, K. A., & Long, J. S. (1993). Introduction. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models*. Beverly Hills, CA: Sage.

Breckler, S. J. (1990). Applications of covariance structure modeling in psychology: Cause for concern? *Psychological Bulletin, 107*, 260-273.

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. Bollen & S. Long (Eds.), *Testing structural equation models* (pp. 136-162). Newbury Park, NJ: Sage.

Buczynski, P. L. (1994). Using hierarchical modeling and practical measures of fit to evaluate structural equation models. *Measurement and Evaluation in Counseling and Development, 26*, 328-339.

Byrne, B. M. (1998). *Structural equation modeling with lisrel, prelis, and simplis*. Mahwah, NJ: Erlbaum.

Cudeck, R., & Browne, M. W. (1983). Cross-validation of covariance structures. *Multivariate Behavioral Research, 18*, 147-167.

Davey, F. H., & Stoppard, J. M. (1993). Some factors affecting the occupational expectations of female adolescents. *Journal of Vocational Behavior, 43*, 235-250.

Fassinger, R. E. (1987). Use of structural equation modeling in counseling psychology research. *Jounal of Counseling Psychology, 34*, 425-436.

Fornell, C. (1982). *A second generation of multivariate analysis* (Vol. 1). New York: Praeger.

Haller, E. J., & Virkler, S. J. (1993). Another look at rural-nonrural differences in students' educational aspirations. *Journal of Research in Rural Education, 9*, 170-178.

Holland, J. L., Gottfredson, G. D., & Baker, H. G. (1990). Validity of vocational aspirations and interest inventories: Extended, replicated, and reinterpreted. *Journal of Counseling Psychology, 37*, 337-342.

Hotchkiss, L., & Borow, H. (1996). Sociological perspectives on work and career development. In D. Brown, L. Brooks, & Associates (Eds.), *Career choice and development: Applying contemporary theories to practice* (3rd ed., pp. 281-334). San Francisco: Jossey-Bass.

Hoyle, R. H., & Smith, G. T. (1994). Formulating clinical research hypotheses as structural equation models: A conceptual overview. *Journal of Consulting and Clinical Psychology, 62*, 429-440.

Joreskog, K. G. (1973). A general method for estimating a linear structural equation system. In A. S. Goldberger & O. D. Duncan (Eds.), *Structural equation models in the social sciences* (pp. 85-112). New York: Academic Press.

Joreskog, K. G. (1993). Testing structural equation models. In K. A. Bollen & J. S. Logn (Eds.), *Testing structural equation models* (pp. 294-316). Newbury Park, CA: Sage.

Joreskog, K. G., & Goldberger, A. S. (1975). Estimation of a model with multiple indicators and multiple causes of a single latent variable. *Journal of the American Statistical Association, 70*, 631-639.

Joreskog, K. G., & Sorbom, D. (1989). *LISREL 7: A guide to program and applications* (2nd ed.). Chicago: SPSS.

Joreskog, K. G., & Sorbom, D. (1993). *LISREL 8: Users' reference guide*. Chicago: Scientific Software International.

Joreskog, K. G., & Sorbom, D. (1996). *LISREL 8: User's reference guide*. Chicago: Scientific Software International.

Keith, T. Z. (1993). Latent variable structural equation models: LISREL in special education research. *Remedial and Special Education, 14*(6), 36-46.

Kelloway, E. K. (1998). *Using LISREL for structural equation modeling*. Thousand Oaks, CA: Sage.

Kunnan, A. J. (1998). An introduction to structural equation modeling for language assessment research [Electronic version]. *Language Testing, 15*, 295-332.

Lapan, R. T., & Jingeleski, J. (1992). Circumscribing vocational aspirations in junior high school. *Journal of Counseling Psychology, 39*, 81-90.

Lent, R. W., Brown, S. D., & Hackett, G. (1996). Career development from a social cognitive perspective. In D. Brown, L. Brooks, & Associates (Eds.), *Career choice and development: Applying contemporary theories to practice* (3rd ed., pp. 423-475). San Francisco: Jossey-Bass.

Leung, S. A. (1993). Circumscription and compromise: A replication study with Asian Americans. *Journal of Counseling Psychology, 40*, 188-193.

Leung, S. A., & Plake, B. S. (1990). A choice dilemma approach for examining the relative importance of sex type and prestige preferences in the process of career choice compromise. *Journal of Counseling Psychology, 37*, 399-406.

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1*, 130-149.

MacCallum, R. C., Wegener, D. T., Uchino, B. N., & Fabrigar, L. (1993). The use of causal indicators in covariance structure models: Some practical issues. *Psychological Bulletin, 114*, 185-199.

Marsh, H. W., Balla, J. R., & MacDonald, R. P. (1988). Goodness-of-fit indexes in confirmatory factor analysis: The effect of sample size. *Psychological Bulletin, 88*, 245-258.

Moore, A. D. (1995). Structural equation modeling in special education research. *Remedial and Special Education, 16*, 178-183.

National Education Longitudinal Study: 1988-94 (NELS:88) [CD-ROM database]. (1996). Washington, DC: U.S. Department of Education, National Center for Educational Statistics, Office of Educational Research and Improvement [Producer and Distributor].

Nichols, R. C. (1992). The national longitudinal studies: A window on the school-employment transition. In J. A. J. Paulter (Ed.), *High school to employment transition: Contemporary issues* (pp. 49-60). Ann Arbor, MI: Prakken.

Osipow, S. H., & Fitzgerald, L. F. (1996). *Theories of career development* (4th ed.). Boston, MA: Allyn and Bacon.

Owings, J., McMillan, M., Ahmed, S., West, J., Quinn, P., Hausken, E., Lee, R., Ingels,

S. J., Scott, L. A., Rock, D., & Pollack, J. (1994). *A guide to using NELS:88 data*. Washington, DC: U.S. Department of Education, National Center for Educational Statistics.

Pedhazur, E. R. (1997). *Multiple regression in behavioral research* (3rd ed.). Orlando, FL: Harcourt Brace.

Quintana, S. M., & Maxwell, S. E. (1999). *Implications of recent developments in structural equation modeling for counseling psychology* [Electronic version]. Counseling Psychologist, 27, 486-527.

Rojewski, J. W. (1996). Using structural equation modeling and path analysis for advancing conceptual and theoretical positions: A technical reaction to Way and Rossman. *Journal of Vocational Education Research, 21*(2), 53-65.

Rojewski, J. W. (1997a). Characteristics of students who express stable or undecided occupational expectations during early adolescence. *Journal of Career Assessment, 5*, 1-20.

Rojewski, J. W. (1997b). The recent and extended past of the JVER--Understanding directions and establishing the content for dialogue. *Journal of Vocational Education Research, 22*, 211-218.

Rojewski, J. W. (1999). Five things > statistics in quantitative educational research. *Journal of Vocational Education Research, 24*, 63-74.

Rojewski, J. W., & Yang, B. (1997). Longitudinal analysis of select influences on the development of occupational aspirations. *Journal of Vocational Behavior, 51*, 375-410.

Saris, W. E., & Stronkhorst, L. H. (1984). *Causal modeling in nonexperimental research: An introduction to the LISREL approach*. Amsterdam, The Netherlands: Sociometric Research Foundation.

Spearman, C. (1904). General intelligence, objectively determined and measured. *American Journal of Psychology, 15*, 201-293.

Steiger, J. H. (1990). Structural model evaluation and modification: An interval estimation approach. *Multivariate Behavioral Research, 25*, 173-180.

Stevens, G., & Cho, J. H. (1985). Socioeconomic indexes and the new 1980 census occupational classification scheme. *Social Science Research, 14*, 142-168.

Super, D. E. (1990). A life-span, life-space approach to career development. In D. Brown & L. Brooks & Associates (Eds.), *Career choice and development: Applying contemporary theories to practice* (2nd ed., pp. 197-261). San Fransisco: Jossey-Bass.

Super, D. E., Savickas, M. L., & Super, C. M. (1996). The life-span, life-space approach to careers. In D. Brown, L. Brooks, & Associates (Eds.), *Career choice and development: Applying contemporary theories to practice* (3rd ed., pp. 121-178). San Francisco: Jossey-Bass.

Wheaton, B., Muthen, B. O., Alwin, D., & Summers, G. (1977). Assessing reliability and stability in panel models. In D. R. Heise (Ed.), *Sociological methodology* (pp. 84-136). San Francisco: Jossey-Bass.

Endnotes

1. The NELS:88 database is administered by the National Center for Educational Statistics, U.S. Department of Education, and represents a national probability sample of over 24,000 adolescents who have been followed at 2-year intervals since 1988 (the third follow-up occurred in 1994 when participants had been out of high school for two years). Data about selected schools and students has been collected from school administrators, parents, teachers, and students at each collection interval (Nichols, 1992; Owings et al., 1994). Since school selection was based on unequal sampling probabilities, all frequencies and statistical analyses reflect the influence of normalized sampling weights to obtain unbiased population estimates. For illustration, our sampling pool consisted of all high school sophomores who provided valid responses to Grade 8 and Grade 10 questionnaires. Adolescents were selected if responses to questionnaires administered two years after high school graduation indicated that they had gone directly to work after graduation. This design criteria resulted in a total of 4,828 high school sophomores (2,563 boys; 2,265 girls).

2. Bollen (1989) identified three components present in general structural equation models: (1) path analysis, (2) the conceptual synthesis of latent variables and measurement models, and (3) general estimation procedures. Path analysis was developed as a method for studying direct and indirect effects of variables hypothesized as causes of variables treated as effects. The conceptual synthesis of latent variable and measurement models is essential to contemporary structural equation techniques. The factor analysis designed by Spearman (1904), what we now call the measurement model, emphasized the relation of latent factors to observed variables. The primary focus of the estimation process, the last characteristic of SEM, is to yield parameter values such that the discrepancy between the sample covariance matrix and the population covariance matrix implied by the model is minimal. Joreskog (1973) proposed a maximum likelihood (ML) estimator for general structural equation models that is the most widely used estimator. The use of ML estimation assumes that the following conditions have been met: (a) the sample is very large (asymptotic), (b) the scale of the observed variables is continuous, (c) the distribution of the observed variables is multivariate normal, and (d) the hypothesized model is valid (Byrne, 1998).

3. The fundamental assumption in SEM is that the error term in each relationship is uncorrelated with all the independent constructs. Studies should be planned and variables should be chosen so that this is the case. Failure to do so will lead to biased and inconsistent estimates of the structural coefficients in the linear equations and will invalidate the testing of the theory. This is one of the most difficult specification errors to test. The relationships in the measurement model also contain stochastic error terms that are usually interpreted to be the sum of specific factors and random measurement errors in the observable indicators. In cross-sectional studies, the error terms should be uncorrelated from one indicator to another. This is part of the definition of being indicators of a construct. If the error terms for two or more indicators correlate, this means that these indicators measure something else or something in addition to the construct they are supposed to measure. If this is the case, the

meaning of the construct and its dimensions may be different from what is intended. It is a widespread misuse of structural equation modeling to include correlated error terms in the model for the sole purpose of obtaining a better fit to the data. Every correlation between error terms must be justified and interpreted substantively (Joreskog, 1993).

4. Latent variables are hypothetical or unobserved variables that are assumed to operate through some combination of known measures.

5. For illustration we have chosen measured variables with single item responses. That is, the X was used as a pseudo-exogenous variable in this MIMIC model. We assumed the Xs are perfect measures of ξ. However, the value of the reliability might be assumed a typical value i.e., .85 if the measure is considered a fallible one. Then the error variance for SES is held fixed at (1-.85) x .variance (see Joreskog & Sorbom, p. 196, 1996 for more information).

6. GFI denotes goodness-of-fit index; AGFI denotes adjusted goodness-of-fit index; NFI denotes normed fit index; and NNFI denotes non-normed fit index.

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