

Student Use of Academic Knowledge and Skills in Work-Based Learning

*Joshua D. Hawley and Helen M. Marks
The Ohio State University*

Using data from in a large Mid-western district, this study analyses the use of academic skills in work-based learning. The primary question asked in this study has to do with the impact of participating in work-based learning on the use of academic skills. Four sets of academic skills were measured using surveys (language arts, math, science, and technology). The results show that career presentations and mentoring impact the use of academic skills more often.

Keywords: Work-based Learning, Workforce Development, Evaluation

Work-based learning continues to elicit debate and inspire experimentation within school districts. Work-based learning refers to paid or unpaid workplace experiences for students in high school or post-secondary schools (Bailey *et al.*, 2004). Typically implemented for students enrolled in career-oriented programs, such as career academies or career and technical education concentrations, work-based learning has a two-fold purpose: to provide students with experiences many of them would not otherwise encounter and to instill in them recognition that education lays the groundwork for economic and social well-being (Newmann & Associates, 1996).

Work-based learning is important to human resource development as well as to education. Given that human resource development is concerned with both the current and the future workforce, organizations have a strong interest in developing techniques to ensure that students are exposed to and adapt to organizations just as new employees do (Jacobs & Hawley, In Press). The large Midwestern school district that is the subject of this study requires *all* students in high school to complete a structured program of 120 hours combining work-based and other community learning experiences as a condition of graduation. The experiences are structured throughout students' high school years, requiring increasingly career-oriented activities. Students are expected to enroll in a career connections class in 9th grade, to perform community service during 10th grade, and to engage in work-based learning in 11th and 12th grades. The school district focuses on skills development in work-based learning as a way to develop both employability skills as well as to foster career development.

This study looks into one aspect of the work-based learning program -- the extent to which students applied knowledge from their academic course work in language arts, mathematics, science, and computer technology in their 12th grade internships.

Theoretical Perspective

Definitions, Emergence of Work-Based Learning

Work-based learning has been applied to a wide range of activities, including everything from formal internships to job shadowing. As defined in the School-to-Work legislation in 1994, work-based learning included structured job training and work experiences (M. A. Hamilton & Hamilton, 1997).

The current usage of the term work-based learning emerged in the late 1980s, as an outgrowth of the experimentation with youth apprenticeships and an interest in adapting the German system to the United States (S. Hamilton, 1990). The theoretical roots of the current push for work-based learning go further back. John Dewey (1916) wrote in *Democracy and Education* that "...education through occupations consequently combines within itself more of the factors conducive to learning than any other method (Dewey, 1916)."

The Structure of Work-Based Learning: The Importance of Academic Skills

Work-based learning is carried out by high school students as a part of a larger secondary school program. In the view of Stern, Dayton & Raby (2000), career academies use work-based learning as a way to tie classroom activities to internships with employers. In Career Academies studied by Kemple, Poglinco & Snipes (1999) a work-based learning system at the high school level includes employer partners, dedicated staff to match students and employers, facilitation of learning opportunities, and orientation for students and workplace supervisors.

Work-based learning is used as a primary focus of a wide range of high school reform models, although the

specific features of work-based learning differ across schools and districts. The core of work-based learning is the availability of internships or cooperative education with organizations within or outside the school (Steinberg, 1997). As Steinberg reports, the ...” challenge is to create something that does not look like school...or like work.” Work-based learning implies that students are placed in a position where they are both gaining valuable work experience but also where the work is connected directly to courses or programs of study in school.

One key principal of the work-based learning system is the integration of classroom and work-based learning. Hughes et al. (1999) studied three schools where an explicit effort was made to connect work-based learning with classroom instruction (Hughes, Moore, & Bailey, 1999). This study documented the use of work-based learning as a way to reinforce the use of academic skills or possible as a way to explore and test what was learned at school. This discussion helps frame the specific questions about the use of academic skills in work-based learning. Are students reporting applying content knowledge in work settings? Does the application of academic knowledge vary depending on the structure of the work-based learning program (core components) or school level factors (enrichment experiences)?

Personal and Core Components

Thus far our discussion of the factors that impact work-based learning focuses on two elements. The personal and academic background factors, and what be termed the structural or core components. As shown in other literature, the success in school is dependent upon individual factors, such as socio-economic status.

The core aspect of work-based learning focuses on the variation in internship experience. We hypothesize that the impact of work-based learning and the use of academic skills in internships is dependent upon program design features which will vary by student over time. In our study we view these core components as student participation in activities as defined by the district as central to the completion of the program. The primary measure is the percentage of students that complete all of the career components as defined by district policy. Secondary measures included student participation in a career connections course, job shadowing, internships (paid or unpaid) and community service. These core components exist as different levels of the intensity of work-based learning. The least intensive includes completion of a career connections class or participation in a job shadow. These activities require relatively little work-based instruction or experience. The next most intensive activities include community service learning, which may require significant time on part of the student but is theoretically less related to job specific knowledge. The final and most intensive form of work-based learning in our study are paid and unpaid internships.

The research literature allows us to distinguish potential impact of these core components on student success. Haimson & Bellotti (2001) used surveys from a sample of participants in national school-to-work funded programs to examine factors that distinguish high quality internships. Participation in less intensive learning activities is most common. In Haimson & Bellotti (2001), 13% of students participated in a paid internship position and 17% participated in an unpaid position. In a study from Kemple, Poglinco & Snipes (1999), a higher proportion of students with strong GPA's had unpaid or paid experiences than job shadows or jobs connected to high school. The authors concluded that up to 26% of students had participated in high quality work-based learning. No study has examined the impact of participating in all of these factors at once as our study methodology allows us to do.

Enrichment Components

The research literature helps to identify key characteristics of programs or schools that could distinguish high quality work-based learning from low quality experiences. Kemple, Poglinco & Snipes (1998) defined high quality programs as those where students reported "...using reading, writing, or computer skills, receiving advice on general and specific work expectations, having the opportunity to learn new things, and being engaged.” This list encompasses three factors that can influence the quality of work-based learning; 1) the intensity of the use of academic content, 2) the involvement of the human resources system at the work place, and 3) the engagement or development of new knowledge as part of the internship. The measure of core components we incorporate the first factor, as the spectrum of activities from job shadowing, to career awareness and internships allows us to focus on the intensity of the experience. However, we include additional items in the model such as attendance at a vocational school that are likely to affect the intensity of the experience.

There is a strong rationale to assume that both mentoring and some involvement with the human resources department of a firm would positively impact the quality of work-based learning. Steinberg (1997) focuses explicitly on the importance of adult role models in the development of strong work-based learning. Shanahan (2000) reviews the relationship between adult roles and the transition to adulthood among adolescents, focusing explicitly on describing the historical changes and the differences among youth of different backgrounds.

Research Questions

This study looks into one aspect of the work-based learning program -- the extent to which students applied knowledge from their academic course work in language arts, mathematics, science, and computer technology in their 12th grade internships. In analyzing the application of academic knowledge to work-based learning, our primary objective is to evaluate the influence of the *core components* of a work-based learning program. Core components are the central experiences in which students participate as part of a work-based learning curriculum, such as job shadows, formal classes in career opportunities, business technology, required community service, and unpaid internships. Since the district structures these experiences to culminate in the 12th grade internship, we would expect them also to influence the application of academic skills. For comparative purposes, our secondary objective is to investigate how various *enrichment experiences* -- over and above the core program components -- may enhance students' application of academic skills. The enrichment experiences we evaluate include attending a career center, having an adult mentor, engaging in service learning, interacting on career issues with school personnel, and receiving feedback on the internship from a school supervisor. The analyses control for characteristics of students' social and academic background that could influence the application of academic knowledge in the workplace. There are three research questions:

1. How did the participation in core components vary among completers and non-completers?
2. How did the participation in enrichment experiences vary among the completers and non-completers?
3. How did participation in different types of career experiences (core, enrichment) support the use of academic skills (language arts, math, science, technology) in internships?

Methods

Data and Sample

Data for this study were collected in the Spring of 2002 as part of an evaluation of the a large Midwestern school district internship program. To understand the experiences of the Class of 2002 with the Internship Program, the researchers conducted three inter-related activities at the district's 18 high schools. Researchers administered surveys to the graduating seniors; they conducted focus group interviews with 6-8 seniors who participated in the Internship Program, and they interviewed the teachers who coordinated the school internship program. Most of the high schools (i.e., 15 of them) participated in all of the evaluation components, and all of the high schools participated in at least two.

The analyses reported in this study draw on data from the student surveys. The surveys queried the seniors on their completion of each Internship Program component during high school, their positions and job duties during their 11th and 12th grade internships, their perceptions about the integration of academic and technical skills at the internship sites, their experiences of mentoring, their attitudes towards civic engagement, their interests and plans for post-secondary education or career, and their social and academic background.

Although responding to the surveys was voluntary, the researchers provided seniors with an incentive to participate, a coupon for one dollar redeemable at a quick-serve restaurant chain. Sixty-seven percent of the senior class, representing 1,773 students, returned surveys. The median percentage of surveys returned was 75 percent from each school. The student sample is 56 percent female, including 867 girls and 686 boys.. Approximately 50 percent of the respondents are African-American, 35 percent European-American, 7 percent Asian, 5 percent Latinos/as, and 3 percent Native American.

Measures

Dependent variables. Four dependent variables measure the extent to which students applied classroom subject matter in *language arts, mathematics, science, or technology* as part of their Grade 12 internship. Each of these measures was constructed as a factor, using principal components analysis with varimax rotation, from a series of survey items, each with three response options: "Never," "Occasionally," "A lot."

For the *language arts* measure, students responded a series of items querying them on how often in a typical week of their Grade 12 internship they (a) Read letters, memos, or reports? (b) Wrote letters, memos, or reports? (c) Read manuals or reference books, including catalogs? The reliability or internal consistency of *language arts*, as measured by Cronbach's alpha (α) is .79. For the *mathematics* measure, students indicated how often in a typical week they (a) Read or filled out bills, invoices, spreadsheets, budgets? (b) Measured or estimated the size or weight of objects? (c) Calculated prices, costs, or technical specifications? The reliability of the *mathematics* measure is .70.

For the *science* measure, students indicated (a) How often they applied environmental/ecological concepts? (b) Used biological or medical knowledge to test samples or interact with patients? (c) Performed activities using

concepts from chemistry class? (d) Applied concepts from physics class to employment activities. The reliability of the *science* measure is .89. For the *technology* measure, students indicated how often in a typical Grade 12 internship week they (a) Used the computer for word processing? (b) Sent and received e-mail? (c) Searched the Internet? (d) Performed technical activities, such as data entry and access, spreadsheets, and other computer programs? (e) Wrote software or applications for the computer? The reliability of the technology measure is .87.

Independent variables. The independent variables reflect our three areas of inquiry – the relationship the application of academic knowledge during the Grade 12 internship to the: (1) Core components of the internship program, Enriched experiences students may have during the internship, and (3) students’ personal and academic background.

The core components include six dummy variables, coded ‘1’ = ‘Yes,’ ‘0’ = ‘No,’ each indicating one component of the internship program that students were expected to complete before entering into the Grade 12 internship. Although most of the components were linked to a particular year of high school (shown in parentheses, if applicable), even if students participated in the activity “out-of-grade,” they were coded ‘1’ or ‘Yes’ on the component. The components include: (1) enrollment in a *Career Connections* course (Gr. 9), (2) *Job Shadowing*, (3) attendance at *Career Presentations*, (4) enrollment in a *Business Technology* course, (5) *Required Community Service* (Gr. 10), (6) *Unpaid Internship* (Gr. 11).

The quality of students’ internship programs may have been augmented through various “value-added” activities that may potentially have enriched their basic participation in the core components. The model includes six enrichment experiences: (1) attendance at a *Career Center*, (2) *Speaking with School Personnel* about a career goal, (3) participated in *Service Learning* (rather than community service alone), (4) received *Internship Feedback* from a school supervisor, (5) *Experienced Mentoring* during high school, and (6) *Completed the Sequence* of internship program components. Each of the six enrichment experiences is coded as a dummy variable, ‘1’ = ‘Yes,’ ‘0’ = ‘No.’

The measures of students’ personal and academic background include female gender, race, language-speaking status, Grade Point Average (GPA), and socioeconomic status (SES). Four of these measures are dummy variables: (1) *Female* gender is coded ‘1’ = ‘Yes,’ ‘0’ = ‘No;’ (2) *African American* (compared to any other racial or ethnic category) is coded ‘1’ = ‘Yes,’ ‘0’ = ‘No;’ (3) *European American* (also compared to any other racial or ethnic category) is coded ‘1’ = ‘Yes,’ ‘0’ = ‘No;’ (4) *English as a Second Language* is coded ‘1’ = ‘Yes,’ ‘0’ = ‘No.’

GPA is a continuous variable constructed from students’ self-reports of their grades during senior year in mathematics, English, social studies, and science from the following response options (a) does not apply – I have not taken any classes in that subject this year (coded as missing), (b) mostly A’s (coded as ‘4.0’), (c) about half A’s and half B’s (coded as ‘3.5’), (d) mostly B’s (coded as 3.0), (e) about half B’s and half C’s (coded as 2.5), (f) mostly C’s (coded as 2.0), (g) about half C’s and half D’s (coded as ‘1.5’), (h) mostly D’s (coded as 1.0), (I) mostly below D (coded as .5), (j) does not apply to me – my classes are not graded (coded as missing). Students’ grades in each subject area were averaged to calculate the *GPA*. For the analyses, *GPA* is standardized, $M=0$, $SD=1$.

SES is a composite measure constructed from *parent(s)*’ *educational attainment* as reported by the student, and from the total number of selected *household possessions*. Response options for each parent’s education included (a) did not finish high school (coded ‘1’), (b) high school graduate (coded ‘2’), (c) vocational or trade school (coded ‘3’), (d) junior or community college (coded ‘4’), (e) some college (coded ‘5’), (f) college graduate (coded ‘6’), (g) master’s degree (coded ‘7’), (h) Ph.D., M.D., etc. coded ‘8’), (i) don’t know (coded ‘missing’). Each parent’s educational attainment was standardized, $M=0$, $SD=1$. If data were available for both parents, the scores were averaged and re-standardized, $M=0$, $SD=1$. *Household possessions* included the total (from a standard list used to calculate SES) of reading materials and information resources, appliances, electronic items, and whether the student has his or her own room. The total of *household possessions* was standardized, $M=0$, $SD=1$. The *SES* measure, an index summing parental education and household possessions, is standardized, $M=0$, $SD=1$.

Analytic Approach

Our data are nested, that is, the students surveyed were enrolled in 17 different high schools. On this basis, we selected a multilevel analytic technique, hierarchical linear modeling (HLM), for the analyses. Moreover, because the 17 high schools differ considerably both in academic emphasis (three are lottery schools with strong reputations for achievement and college placement) and in their approach to the internship program (for example, two schools provide a day of released time from the school week for students to spend at their internship sites), we expected to find considerable variation between schools on students’ application of their classroom learning. An HLM analysis typically begins with estimates of the variation in the dependent variables that is attributable to between-school differences – such as their internship programming, and to within-school differences – such as personal and academic background differences among the students the schools enroll.

Because our objective is to evaluate the relative contribution of the core components and the enrichment experiences to the application of classroom knowledge both singly and as a cluster, we conduct each within-school analysis using three sequential models. The first model estimates the contribution of the core components of the internship program. The second model evaluates the impact of enrichment experiences. The third model examines the extent to which students' personal and social background accounts for variation in the outcomes. We conduct the same analyses for the application of classroom knowledge in four subject areas – language arts, mathematics, science, and technology.

Since the small number of schools in the sample precludes developing a school-level model to investigate between-school variation, our strategy is to conduct separate between-school analyses (adjusting for the within-school variation accounted for by the three models) in which we enter each school as a dummy variable. That approach would yield an estimate of each school's contribution to the application of classroom knowledge net of differences in students and their experiences.

Results

Because only two-thirds of the sample reported completing a 12th grade internship, we compared these students to their peers who did not intern as seniors on three main sets of characteristics – personal and academic background, participation in the core components of the internship program prior to the 12th grade, and the enrichment activities they experienced in conjunction with their participation in any of the aspects of the internship program.

12th Grade Internship Completers and Non-Completers: Observed Differences

Personal and academic background. Demographic differences around race and social class separated the groups. African American students were more significantly more likely to complete internships than not, a marked contrast to European American students, who were less likely. The socioeconomic background for completers was somewhat higher on average than for non-completers. Gender, being a native speaker of English, and grade point average were not significantly different among the groups.

Completion of program core components. The internship program attempted to provide students with an integrated set of experiences throughout high school that would serve as a pathway to a meaningful internship in Grade 12. Completion of these program components varied among students with just 15 percent of them reporting that they experienced each activity. Although the students in our sample were not required to enroll in Career Connections, a course designed to present them with opportunities to explore various occupations and professions, about as many completers as non-completers, over a third of each group, took the course at some point during high school. Completers were more significantly likely to participate in job shadowing (53 percent) than non-completers (40 percent), and, on average, they attended significantly more career presentations (2.7 vs 2.4). About half the completers and non-completers participated in a Business Technology course, usually a 10th grade offering. Service in the community was somewhat more common among the completers, 71 percent of the completers volunteered compared to 66 percent of the non-completers. Significantly more of the completers than non-completers (57 percent to 31 percent) participated in the unpaid internship during 11th grade.

Enriched experiences. Completers were significantly more likely than non-completers to have had enrichment experiences over and above the core components of the internship program. These activities, interactions, or relationships had the potential to enhance their participation. More completers than non-completers attended career centers (24 percent to 17 percent); spoke with school personnel about their career goals (72 percent to 65 percent); considered their volunteer work as service learning (.08 vs -.19); received feedback from their school supervisors (15 percent to 3 percent); and had a mentor during high school (45 percent to 31 percent).

Use of Academic Skills In the 12th Grade Internship

A series of four HLM analyses investigate the relative importance of core components and enrichment experiences on students' use of academic skills related to Language Arts, Mathematics, Science, and Technology in their 12th Grade internships. Each of these analyses proceeds sequentially to evaluate these relationships in three cumulative models: (1) core components; (2) enriched experiences; (3) personal experiences.

Language arts. Two core components – job shadowing and, to a somewhat less extent, attendance at career presentations – contributed significantly to applying language arts skills in the internship (.3 SD and .1 SD). While reducing the relationship of the core components somewhat, participating in enrichment experiences increased the likelihood of students' applying these skills. Having a mentor during high school has the strongest relationship to applying language arts skills (.4 SD). Model 2 added considerably to the explanation of the variance in the use of these skills, R^2 .11 compared to R^2 .03 in Model 1.

Mathematics. Unlike the pattern for language arts, job shadowing did not influence students' use of mathematics in their internships, although attending career presentations had a significant positive relationship,

although a small one (.1 SD). Participating in an unpaid internship was negatively associated with the application of mathematics skills in the 12th grade internship (-.2 SD), suggesting that as seniors some students may have continued in unpaid internships that did not entail applying mathematics skills.

Science. Students who applied science skills during their 12th grade internship had a positive, although marginally significant, experience with a career connections course (.2 SD). Attending presentations about future careers had a positive link with using science as an intern during senior year (.1 SD). As with the use of language arts and mathematics skills, the enrichment experiences of service learning and being mentored had a positive association with the application of science skills (.2 and .4 SD, respectively). While the application of language arts and mathematics skills were largely independent of personal background, the use of science skills in the internship had a negative relationship with female gender (-.2 SD). Overall, the models explain up to 11 percent of the variance for applying science skills during the internship with the largest contribution coming from enrichment experiences.

Technology. None of the core components contribute to the application of technology skills during the 12th grade internship, but enrichment experiences are linked to their use. As was the case for the application of skills in the other subject areas, having a mentor is positively associated (.3 SD). The full model explains 10 percent of the variance in the use of technology skills.

Conclusions

This article used a large survey and data from individual schools to better understand how students participate in a district wide work based learning program in a large Midwestern school system. The study focuses on answering questions about the relationship between core and enrichment components of the work based learning program and the use of academic skills from language arts, mathematics, science, or technology.

Relationship Between Work-Based Learning and Academic Skills

The primary question asked in this study has to do with the impact of participating in work-based learning on the use of academic skills. Four sets of academic skills were measured using surveys (language arts, math, science, and technology). The results show that among the core components, career presentations positively impacted the use of academic skills in three out of four areas (language arts, math, and science). Career connections, participation in job shadows, and participation in an unpaid internship all positive impacted the use of academic skills in just one area. Interestingly, completing a business technology course or participating in required community service did not have an impact in any of the four areas in terms of applying academic skills. Moreover, none of the core components had any impact whatsoever on the use of technology skills in a 12th grade internship. The quality of work-based learning is partly related to the core characteristics of the experience. In this research we learn that some of the more important core components include career presentations, rather than some of the more intensive components such as required community service. The second conclusion one might make from this is that the type of internship activities might impact the use of academic skills in different areas. While language arts, mathematics, and science seem to be affected by the type of core components, technology skills appear weakly related to any of the core components.

In contrast, in terms of the enrichment components, a wide range of the supplementary characteristics are positively related to use of academic skills. The strongest finding for the whole analysis is that mentoring is positively related to increased likelihood of use of academic skills in each of the four areas. The magnitude of the impact of mentoring was stronger than any other factor in each model. Secondly, volunteering to participate in service learning and “school supervisor gives internship feedback” are related in three of the four academic areas with increased use of skills. In the case of the “feedback” variable this fits into the larger literature on quality of work-based learning, showing that as adults hold students accountable for their actions that students participate in higher quality internships. In contrast, there is no established basis for showing that voluntary community service positively impacts the use of academic skills, but there are a number of studies showing the benefits for students of voluntary community service on academic achievement. Finally, attendance at a career center in junior-senior years (vocational-technical education) is positive related to both use of language arts skills and technology. There appear to be only minor gender differences in terms of the use of academic skills - controlling for core and enrichment components – except for science skills.

Implications for HRD Research

Business and education leaders alike are concerned that the linkages between school and career development are not strong. There is an abundance of evidence showing that the current career development system is not working, either for youth electing to pursue post-secondary opportunities or move directly into work (Kerckhoff, 2002; Rosenbaum, 2002). Work-based learning is an important pedagogical strategy designed to help students make that transition more effectively.

This research illustrates the relatively low use of academic skills in work-based learning settings. The implications for future research come in three areas, developing metrics that focus on the quality of work-based learning; and, examining the tradeoffs between formal mentoring or more extensive work-based learning programs; and examining work-based learning from the organizational perspective.

The measurement of work-based learning. Our study further helps to define work-based learning by focusing on the separation of core and enrichment components. The core components include different types of work-based experiences, but the enrichment aspects include both attributes of individual experience in work-based learning, as well as educational and work-place characteristics. However, the cross sectional nature of these experiences imply that they are separated and not linked together. A new study would look at how entry level workers (secondary students or new employees) use academic and work based learning together to develop a better model of work-based learning overall.

Mentoring or work-based learning. One of the chief empirical findings from this study is that mentoring, defined broadly, is among the most important factors predicting the use of academic skills in high quality internships. Therefore, we wonder if future research can figure out if mentoring in and of itself, or internships in and of themselves are more beneficial. It might be that while both mentoring and internships are useful, that mentoring offers substantial benefits for a lower cost.

Work-based learning from an organizational perspective. The study did not include interviews with human resource or line managers, typically staff assigned to coordinate work-based learning activities. Future research needs to be done to assess the quality of the learning experience from the perspective of the employer.

References

- Bailey, T., Hughes, K., & Moore, D. T. (2004). *Working knowledge: Work-based learning and education reform*. New York: Routledge Falmer.
- DeSalvatore, L., Goldberger, S., & Steinberg, A. (2000). *From innovative programs to systemic education reform: Lesson from five communities. The final report of the benchmark communities initiative*. Boston, MA: Jobs for the Future, Inc.
- Dewey, J. (1916). *Democracy and education: An introduction to the philosophy of education*. New York: The Macmillan Company.
- Haimson, J., & Bellotti, J. (2001). *Schooling in the workplace: Increasing the scale and quality of work-based learning*. Princeton, NJ: Mathematica Policy Research.
- Hamilton, M. A., & Hamilton, S. F. (1997). When is work a learning experience? *Phi Delta Kappan*, 78(9), 682-689.
- Hamilton, S. (1990). *Apprenticeship for adulthood: Preparing youth for the future*. New York: Free Press.
- Hughes, K., L., & Moore, D., T., & Bailey, T., R. (1999). *Work-based learning and academic skills* (IEE Working Paper No. 15).
- Jacobs, R & J. Hawley (In Press). Emergence of workforce development: Definition, conceptual boundaries, and future perspectives. In R. MacLean and D. Wilson (eds.), *International Handbook of Technical and Vocational Education and Training*. Bonn, Germany: UNESCO-UNEVOC.
- Kemple, J. J., & Scott-Clayton, W. J. (2004). *Career academies: Impacts on labor market outcomes and educational attainment*. New York City: MDRC.
- Kemple, J. J. (1997). *Career academies communities of support for students and teachers: Emerging findings from a 10-site evaluation*. New York City: Manpower Demonstration Research Corporation.
- Kemple, J. J., Poglinco, S. M., & Snipes, J. C. (1999). *Career academies: Building career awareness and workbased learning activities through employer partnerships*. New York, NY: Manpower Demonstration Research Corporation.
- Kemple, J. J., & Snipes, J. C. (2000). *Career academies: Impacts on student' engagement and performance in high school*. New York: Manpower Demonstration Research Corporation.
- Kerckhoff, A. C. (2002). The transition from school to work. In J. T. Mortimer & R. W. Larson (Eds.), *The changing adolescent experience: Societal trends and the transition to adulthood* (pp. 52-67). London: Cambridge University Press.
- Larson, R. W., Wilson, S., Brown, B. B., Furstenberg, J., Frank F., & Verma, S. (2002). Changes in adolescents' interpersonal experiences: Are they being prepared for adult relationships in the twenty-first century? *Journal of Research on Adolescence*, 12(1), 31-68.

- Newmann, F., M., & Associates. (1996). *Authentic achievement: Restructuring schools for intellectual quality*. San Francisco: Jossey-Bass Publishers.
- Rauner, F. (1998). School-to-work transition: The example of Germany. In D. Stern & D. A. Wagner (Eds.), *International perspectives on the school-to-work transition* (pp. 237-271). Cresskill, New Jersey: Hampton Press.
- Rosenbaum, J. E. (2002). *Beyond college for all: Career paths for the forgotten half*. New York, NY: Russell Sage Foundation.
- Shanahan, M. J. (2000). Pathways to adulthood in changing societies: Variability and mechanisms in life course perspective. *Annual Review of Sociology*, 26, 667-692.
- Stasz, C., & Brewer, D. (1998). Work-based learning: Student perspectives on quality and links to schools. *Educational Evaluation and Policy Analysis*, 20(1), 31-46.
- Steinberg, A. (1997). *Real learning, real work: School-to-work as high school reform*. New York: Routledge.
- Stern, D., Dayton, C., & Raby, M. (2000). *Career academies: Building blocks for reconstructing high school*. Berkeley, CA: University of California at Berkeley, Career Academy Support Network.
- Vickers, M. (1997). Working to learn: Building science understandings through work-based learning. In A. Steinberg (Ed.), *Real learning, real work: School to work as high school reform* (pp. 109-128). New York: Routledge.
- Wagner, K. (1999). The German apprenticeship system under strain. In P. D. Culpepper & D. Finegold (Eds.), *The German skills machine: Sustaining comparative advantage in a global economy* (pp. 37-76). New York: Berghahn Books.
- Wieler, S. S., & Bailey, T. R. (1997). Going to scale: Employer participation in school-to-work programs at La Guardia community college. *Educational Evaluation and Policy Analysis*, 19(2), 123-140.