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**Post-secondary Employment and College Enrollment among
Montgomery County Public Schools (MCPS) Graduates:
The Role of Career-Focused Programs**

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Introduction

Over the years, many have speculated about the post-secondary school and employment activities of Montgomery County Public Schools (MCPS) graduates. Knowledge of what our graduates do after high school graduation, in particular, how well they perform in college and in the workplace, is unarguably of paramount importance. Knowing which aspects of students' high school education are associated with successful transitions to college and to the workplace has implications for maintaining, redesigning, expanding, or developing programs to better meet the needs of our graduates in tomorrow's workplace.

Despite the clear demand for this knowledge and its undeniable importance to understanding and preparing our youth for their futures, there have been few, if any, systematic, large-scale studies examining graduates' post-secondary school and employment activities. Consequently, recurrent questions about our graduates remain unanswered; questions, such as:

- To what extent do graduates follow through with their post-secondary school and career plans? What do MCPS graduates do after high school graduation?
- How well do MCPS graduates perform in college? What are their first-year grade point averages? How many complete their degrees? How long do graduates take to complete college degrees?
- How well do MCPS graduates perform in the workplace? How many graduates are employed? In what industries are they employed? What are graduates' earnings?
- What effect does high school career and technology education have on graduates' post-secondary school and employment activities?

Graduate Follow-up Studies

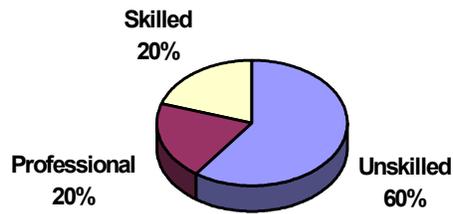
This report summarizes the results of studies that have been conducted over the past year to answer these long-standing questions. Most results reported here come from a study of the 1993 MCPS graduates whose post-secondary school and employment activities were examined after their high school graduation through 1999.² Results from two other studies are included in this summary, insofar as they elaborate on consistent themes and interpretations of results presented here. The first additional study reports post-secondary

school and employment activities of the 1996 MCPS graduates one year after graduation, as well as their perceived preparation for college and for employment.³ The second additional study reports the post-secondary school and employment plans of the 2000 MCPS graduates and their perception of how well their high school program prepared them in job and computer technology skills.⁴

Meeting the Demands of a Changing Workforce

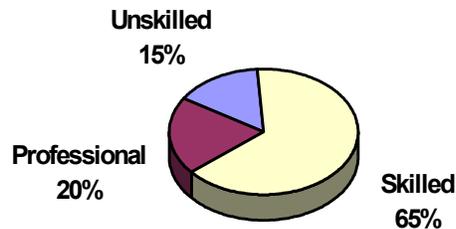
Much of this summary focuses on results relating to the school district’s role in preparing students for the transition from school to future careers. There have been increased national, regional, and local concerns about the perceived inadequacy in the preparation of youth for the changing workplace.^{5,6}

Figure 1. Percentages of the 1950 Workforce Representing Unskilled, Skilled, and Professional Workers



Emerging technologies in the workplace and changes in industry have resulted in many more technical jobs, not necessarily requiring 4-year college degrees, but rather applied, technical skills. To illustrate, recently published data from the Bureau of Labor Statistics⁷ showed that more than 65% of all jobs in the year 2000 require specialized education (i.e., more than a high school diploma but less than a 4-year college degree), nearly tripling since the 1950s. Curiously, the percentage of careers requiring 4-year degrees has remained the same for the past 50 years, around 20% for professional occupations.

Figure 2. Percentages of the 2000 Workforce Representing Unskilled, Skilled, and Professional Workers



Highlights of Results

Results show that high school students who participated in career and technology education (CTE)⁸ performed as well, if not better, in the workplace and in college than did other graduates. CTE graduates worked more and more continuously across the 6-year follow-up period than non-CTE graduates. CTE graduates had higher earnings than non-CTE graduates, even when considering background characteristics, post-secondary college and work activities, and quarters worked. Additionally, CTE graduates were more certain about their post-secondary education and career plans and felt well-prepared for employment.^{2,4}

The increased diversity of MCPS graduates from 1993 to 1999 can be seen in the growing numbers of students participating in the Free and Reduced Price Meals (FARMS) or English for Speakers of Other Languages (ESOL) programs (see Table 1). Plans for college or work reported by graduates of the class of 1993 and the class of 2000, however, were very similar.

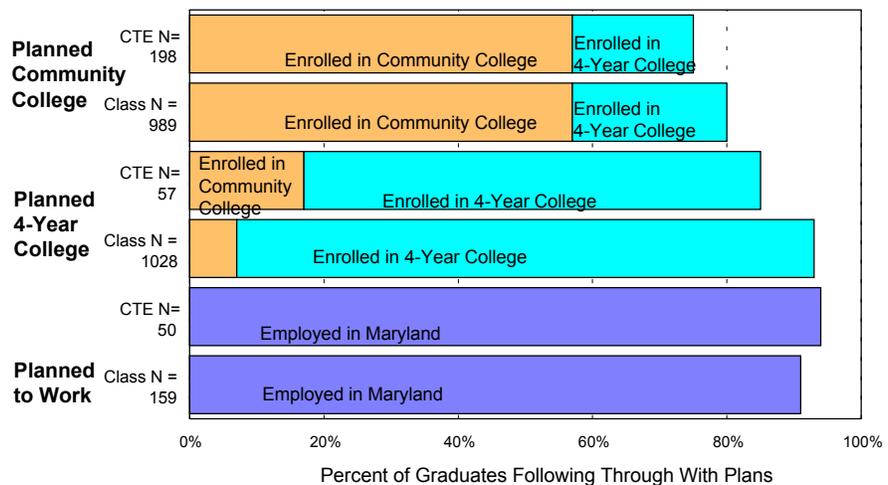
Table 1. Characteristics of MCPS Graduates Class of 1993 and Class of 2000

Curriculum / Background Characteristic	1993 All Graduates (N=6284)	1993 CTE Graduates (N=623)	2000 All Graduates (N=7047)	2000 CTE Graduates (N=699)
Total % planning post-secondary education	91.5	81.5	93.5	84.0
% planning to attend 4-yr coll.	66.2	28.4	67.1	35.1
% planning to attend 2-yr coll.	25.3	53.1	26.4	48.9
% planning work or military	6.1	16.3	5.2	10.6
% FARMS	20.3	38.2	37.7	61.5
% ESOL	16.2	24.7	22.0	27.0

CTE graduates represented approximately 10% of the graduating classes of 1993 and 2000. Percentages of students participating in FARMS or ESOL programs were greater among CTE graduates compared to graduates overall, both in 1993 and in 2000. In both years, greater percentages of CTE graduates planned to attend 2-year colleges than graduates overall. The percentage of CTE graduates planning to attend 4-year colleges was greater in 2000 than in 1993, whereas the percentage planning to work (and not attend college) was lower in 2000.

MCPS graduates followed through on their post-graduation plans. Post-secondary activities of the 1993 graduates, both overall and among CTE graduates, were consistent with their plans at graduation. Those graduates who planned to enter community colleges did so, entering 2-year or 4-year colleges at a rate of 80%. A somewhat lower (but not statistically different) percentage of the CTE graduates planning to attend community colleges actually enrolled in 2-year or 4-year colleges (74%). Ninety-three percent of those who planned to attend 4-year colleges actually attended 2-year or 4-

Figure 3. Consistency of Plans at Graduation and Activities During Follow-Up of 1993 CTE Graduates and Whole Class



year colleges. Eighty-six percent of CTE graduates who planned to attend 4-year colleges actually enrolled in 2-year or 4-year colleges. This percentage did not differ statistically from the class as a whole. Over 90% of the group that planned to only work after high school actually did. CTE graduates who planned to only work were the most consistent of all, with 94% of these graduates employed during the 6-year follow-up period.

College performance of CTE graduates matched that of other graduates. The college performance of CTE graduates was comparable to that of other graduates. Table 2

summarizes several measures of college performance for the 1993 CTE graduates and other MCPS graduates attending community colleges or 4-year colleges in Maryland during the 6-year follow-up period. The grade point average (GPA) of the CTE program graduates was comparable to that of other graduates, both in community colleges and

Table 2.
College Performance of 1993 MCPS Graduates
Attending Community College or 4-Year College in Maryland

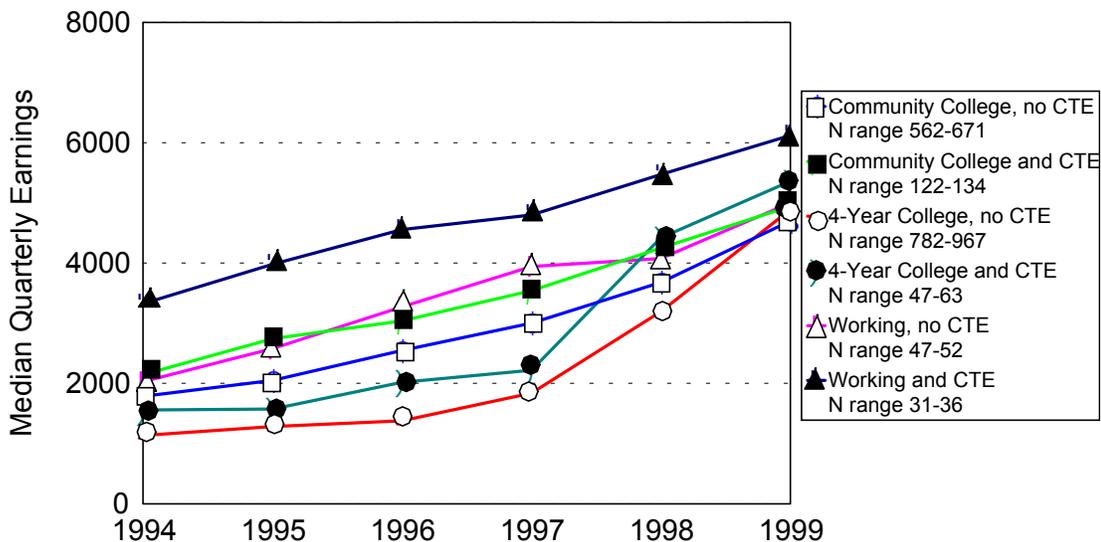
Performance Measure	Community College, no CTE (N=818)	Community College, with CTE (N=167)	4-Year College, no CTE (N=1384)	4-Year College, with CTE (N=88)
First Year Cumulative GPA (mean)	1.8	1.9	2.6	2.6
Years to degree (mean)	3.9	4.4	4.5	4.5
% received degree	5.4	6.0	61.3	60.2

in 4-year colleges. Results show that the number of years taken to earn a degree among CTE graduates attending community colleges was about half a year more than that taken by other graduates attending community colleges.

Earnings were higher among CTE graduates. An analysis of earnings over the 6-year follow-up period showed that CTE graduates had higher earnings across time than other graduates. Higher earnings were observed even when CTE graduates and non-CTE graduates were matched by college and work plans and when considering FARMS status and quarters worked. For those who attended 4-year colleges, CTE graduates earned more than non-CTE graduates. These earnings differences were evident each year, but statistically significant for years 1994-98. CTE graduates who attended community colleges had significantly higher earnings than their non-CTE classmates. CTE graduates who were working and not attending colleges had significantly higher earnings than their working non-CTE counterparts. Figure 4 summarizes the quarterly earnings of the various college and work groups, with and without CTE completion.

Additionally, graduates who completed CTE reported higher hourly wages in the study of 1996 graduates.³ This result was evident even when background characteristics, and high school curriculum and performance were considered.

Figure 4.
Quarterly Part-Time or Full-Time Earnings of 1993 Graduates
By College, Work, and CTE Program Completion

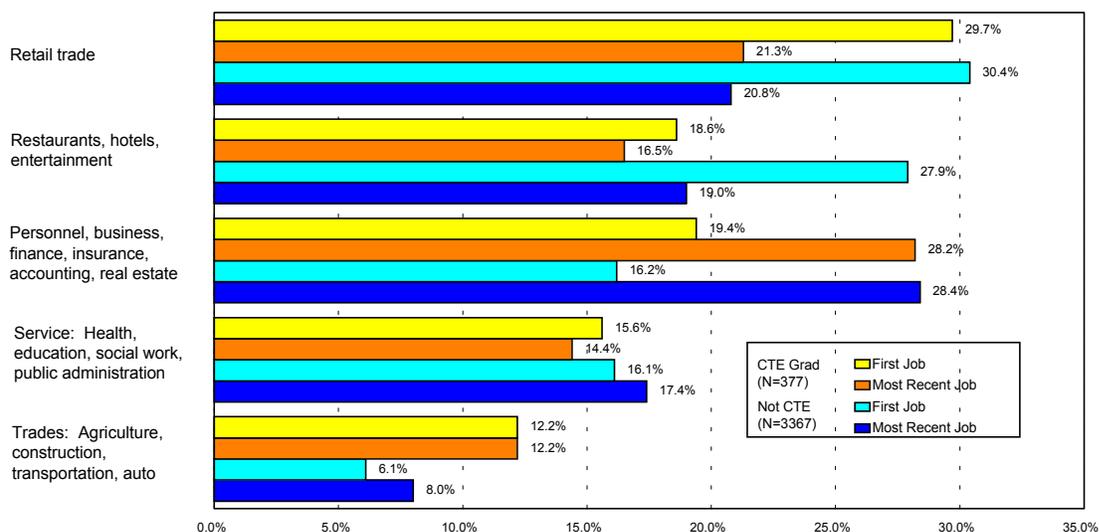


Note. All wages are in 1999 dollars.

CTE graduates entered more career-focused areas of employment. Completion of CTE appeared to have some influence on the area of industry in which the graduates were employed. A smaller percentage of CTE graduates was employed in areas traditionally considered short-term or temporary, such as restaurants, hotels, and entertainment (see Figure 5), especially in their first jobs. More CTE graduates were employed in trades (e.g., construction, transportation, automobile mechanics) than were non-CTE graduates, both at their first job and at their most recent job. Most recent employment in business areas (e.g., personnel, business, finance, insurance, accounting, real estate) was similar for CTE graduates and their non-CTE peers, but CTE graduates were slightly more likely to enter these areas of employment in their first jobs.

Employment rates were higher among CTE graduates. Graduates who completed the CTE program had higher employment rates, with less seasonal variation, than their non-CTE peers. This difference was most evident in the groups that planned to work only or to attend 4-year colleges. CTE graduates in the 4-year college group and work-only group worked more quarters and had longer continuous periods of employment during the 6-year follow-up than their non-CTE peers, even when considering FARMS status. Similarly, the CTE graduates in the class of 1996 reported working more hours per week in their first year after graduation than did their non-CTE peers, even with background and academic characteristics considered.

Figure 5.
Industries Employing 1993 Graduates in First and Most Recent Jobs
Graduates Who Have Completed CTE Program and All Other Graduates



CTE graduates were more certain about their career choices. CTE graduates in the class of 2000 were more likely to have made educational and career-related decisions than were their classmates who had not completed CTE.³ At the time of graduation, 16% of the CTE graduates were undecided on future career or educational plans, compared with 22% of the class as a whole. Differences also were observed in graduates' reports of who influenced their selection of a career. Compared to all graduates, CTE graduates were more likely to name high school internship supervisors, high school career counselors, and middle school counselors as influencing their choices of study and career.

CTE graduates perceived themselves as prepared for employment. Among the class of 2000, CTE graduates reported better preparation for employment.⁴ Compared to all graduates, more CTE graduates reported that their high school prepared them to act appropriately at work, come to work daily, report to work on time, make good work decisions, take initiative, complete tasks, and provide guidance to others. Graduates in the class of 1996 responded similarly.³ CTE graduates were more likely than their non-CTE classmates to report that their high school program prepared them with technical information about the job and what to expect in the workplace.

Study Implications

Several key elements of the present findings have implications for improving current efforts to prepare high school graduates for college and careers.

- First, results validate current national and state initiatives (School-To-Work / Career Connections) that call for public education to more actively prepare young adults for the workforce and their future careers.^{6,7,9,10} Career and technology education incorporates the principles and goals of School-To-Work / Career Connection

initiatives. Having shown the positive effects of career and technology education on graduates' employment activities supports its continued use to help students explore, plan, and prepare for careers.

- Second, results suggest that structured information about careers and exposure to career options throughout students' education is beneficial. Graduates who reported making their career decisions early in their school experience were more likely to name "real life" activities as helping to formulate their decisions about study and career choices.⁴ These activities included job shadowing, jobs outside of school, and summer programs. A possible interpretation of these results is that early school activities provide structured opportunities to investigate career options and help students more purposefully make career decisions.
- Third, results call for developing strategies to broaden students' knowledge and experience of secondary school career and technology education courses and activities. Such strategies might include but are not limited to:
 - Informing students and parents about changes in workplace opportunities, the skills necessary for competing in the modern economy, and the positive effects of secondary school career and work preparation activities.
 - Determining barriers to participation in secondary school career and technology education programs. Possible barriers to participation include: the lack of student, parent, and school staff knowledge about the positive effects of career and work preparation activities, the lack of knowledge about changes in workplace skills needed in the global economy, and the perception of less rigorous academic standards for high school course curriculum associated with career and technology education.
 - Determining ways to offer career and technology education courses and activities so that they fit into the schedules of all students.
 - Having current career and technology education courses, such as accounting, finance, computer science and medical career courses qualify for honors credit or advanced placement. Such offerings would reinforce the academic rigor of career and work preparation courses.
 - Devising ways to formally structure outside work experiences of students. Approximately two-thirds of the high school seniors reported working for pay. However, only 20% of these work experiences are related to a structured school program that reviews and evaluates workplace skills.
 - Examining student community service requirements to determine ways to relate this requirement to the exploration of career options and workplace expectations.

- Encouraging students, school staff, and parents to use four-year plans not only for course selection during secondary school but also for career and work exploration and planning.

Study Methodology

Graduates' employment and college activities from the time of their high school graduation in 1993 through 1999 were used to describe what graduates did after high school. Archival information on graduates' quarterly earnings and areas of employment was obtained from the Maryland Department of Labor, Licensing, and Regulation (MDLLR). Additionally, archival information on graduates' annual enrollment in Maryland post-secondary public schools, first-year academic performance, and highest degree earned was obtained from the Maryland Higher Education Commission (MHEC).

Information obtained on employment and college activities were examined in relation to graduates' high school history including academic performance, courses taken, and career preparation, as well as background characteristics.

Data Limitations

Readers should be mindful of the limitations that the data presented. First, some student groups in analyses were small. Therefore, caution should be exercised in interpreting and generalizing results too broadly. Second, not all graduates had employment and college information. Employment data included only those graduates who worked in Maryland. This situation presented difficulties in deriving employment rates, since it was not possible to know whether graduates had left Maryland or had stayed in Maryland but were not working. College enrollment data included only those graduates who attended Maryland public post-secondary schools. However, problems associated with graduates not having employment and college data appeared not to present major problems: Many of the graduates had employment or college data, and these graduates generally resembled the entire graduating class on key background and curriculum characteristics.

A third limitation pertains to the correlational nature of the study and the lack of available data to use as statistical controls. Differences in college enrollment and employment history among the various graduate groups used in comparisons may be explained by systematic differences among students. For example, programs offering career-focused courses and activities may attract students who differ considerably from other students (in scientific terms, students self-select). The effects of self-selection can sometimes be minimized by the use of standardized tests as statistical controls in analyses, but such test data were not available for all graduates. It should be noted that many of the analyses have considered differences in student background characteristics, career intentions, and high school curriculum when comparing the graduate groups, as methods to reduce the effects of self-selection.

Endnotes

All results reported here are statistically significant (at least at the $p < .05$ level, two-tailed tests). Specific statistical tests and their results are available upon request.

¹ In collaboration with Montgomery County Workforce Development Corporation; Montgomery County Career Connections; Maryland State Department of Education, Division of Career Technology and Adult Learning; Jacob France Center, University of Baltimore; Maryland Department of Labor, Licensing and Regulation; Maryland Higher Education Commission; Montgomery College; and Westat, Inc.

² Office of Shared Accountability (December, 2000). College enrollment history of Montgomery County Public Schools (MCPS) 1993 graduates. Rockville, MD: Applied Research Unit, Office of Shared Accountability, Montgomery County Public Schools. See also, Department of Applied Research and Evaluation (June, 2000). Employment history of Montgomery County Public Schools (MCPS) 1993 graduates. Rockville, MD: Department of Applied Research and Evaluation, Montgomery County Public Schools.

³ Department of Educational Accountability (September, 1998). Post-secondary school activities of Montgomery County Public School (MCPS) 1996 graduates: High school student profiles associated with post-secondary school activities. Rockville, MD: Research and Evaluation Unit, Department of Educational Accountability, Montgomery County Public Schools.

⁴ Office of Shared Accountability (December, 2000). Career plans and perceived job preparation of Montgomery County Public Schools (MCPS) 2000 graduates. Rockville, MD: Applied Research Unit, Office of Shared Accountability, Montgomery County Public Schools.

⁵ Behr, P. (1997). Maryland hurt by labor shortage: Study finds a third of the state's companies in need of skilled workers. The Washington Post, October 23, Financial, p. C3. Beyers, D. (1995). Remediation rate at college alarms educators, county. Montgomery debates standards for graduating from high school. The Washington Post, April 30, Metro, p. B1. Harwood, R. (1997). Lost in the job market: There's work to be had -- and an awful lot of people who aren't being educated to do it. The Washington Post, September 9, Editorial, p. A19. Pham, A. (1992). Left behind on the career track: A growing skills gap leaves young people -- and employers -- with a sense of frustration. The Washington Post, August 24, Financial, p. F1. Swoboda, F. (1991). Job skills gap looms. Panel finds high school students seen as unprepared. The Washington Post, May 30, Financial, p. B10.

⁶ Commission on the Skills of the American WorkForce. (1990). America's choice: High skills or low wages. Rochester, NY: National Center on Education and the Economy. See also citations in Endnote 5.

⁷ American Vocational Association (no date). AVA Guide to the School-To-Work Opportunities Act (pp. 15-21). Washington, D.C.: American Vocational Association.

⁸ These students participated in the Career and Technology Education (CTE) program. The CTE program involves a prescribed sequence of courses leading to state-certified diplomas in CTE. Courses help students acquire specialized knowledge, skills, attitudes, and work habits required for post-secondary vocational education, training, and employment. Areas of study in the CTE program include: business education (marketing, hospitality, and food production), business operations (secretarial, typing, data processing, accounting, etc.), health (allied health, child care, and guidance), trades (masonry, carpentry, plumbing, etc.), automotive, and horticulture. Throughout high school, CTE participants may take several semester-long job placements that combine classroom instruction and work experiences. With the help of school staff, students identify and select work experiences relevant to their school and career plans. Students work at local

businesses, government agencies, industries, or service industries. Employers of students and school staff work collaboratively and serve as role models in developing appropriate and relevant job competencies for students. Ten percent (623 out of 6,284) of the 1993 graduates had completed the CTE program.

⁹ See the policy intent of the School-to-Work Opportunities Act of 1994 and 1998 Perkins III Act cited in U.S. Department of Education (2000). Evaluation plan for the National Assessment of Vocational Education (NAVE). Washington, D.C.: Planning and Evaluation Service, U.S. Department of Education.

¹⁰ Stern, D., Finkelstein, N., Stone, J. R., Latting, J., & Dornsife, C. (1995). School to Work: Research on programs in the United States. London: Falmer. U.S. Department of Labor, Bureau of Labor Statistics (1993). The employment situation: May 1993. News Release, USDL 93-200.