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The Skill (Education) Distribution of Jobs: How Is It Changing?

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Summary

About 3 out of 5 jobs projected to be created through 2008 could have relatively high skill requirements (i.e., typically requiring some postsecondary education). This leaves 8.1 million new jobs for workers with relatively low skill levels (i.e., typically high school graduates). Thus, firms are expected to continue to need workers from a variety of educational backgrounds to fill those jobs that will be added to the labor market by economic growth during the first decade of the 21st century.

Through 2008, the most skilled jobs (i.e., typically requiring a bachelor's degree) could experience the largest percent increase in employer demand. Employment also will likely expand, but at much slower rates, among jobs with lesser skill requirements. Despite the differences in rates of new job creation, *the skill distribution of employment is expected to look much the same: about one-half of all jobs typically requiring at least some postsecondary education and about one-half typically requiring no more than high school completion*. This stability reflects the fact that the projected addition of 20.3 million jobs to the labor market through 2008 represents a small increment to 1998's sizable employment base of 141 million.

Employers need workers not only to fill new jobs, but also to fill existing jobs that become vacant as workers move into other occupations, retire or otherwise leave the labor force. "Replacement needs" are an important source of job openings, particularly in slowly expanding or contracting fields. For example, 3.3 million of the least skilled jobs might be added to the labor market between 1998 and 2008, but 14.1 million new and existing low-skilled jobs might become available over the projection period. The difference reflects the jobs of departing employees that firms will need to fill. While the lowest skilled workers would be qualified to compete for just 16% of the 20.3 million *new* jobs projected to be created through 2008, they have the educational level to compete for 26% of the 55.0 million *new and existing* jobs expected to open up over the 10-year period. Thus, a focus on job growth alone provides an incomplete picture of employers' skill requirements and a misleading impression of the job market faced by low-skilled workers.

Oftentimes, members of the education and training community have focused on those occupations expected to grow the most rapidly to urge students to obtain a bachelor's degree or, at the least, get postsecondary education that leads to an associate's degree or vocational certificate. This analysis demonstrates that jobs will continue to be there in abundant numbers for workers with no more than a high school education, that is, the report addresses the employment prospects of relatively low-skilled workers. In terms of wage prospects, however, firms have been paying a much larger premium than in the past to employees with bachelor's degrees. The current size of the wage gap between more and less educated workers suggests that there is something in addition to the barely perceptible shift toward heightened job skill requirements (as measured by educational attainment) that has prompted employers to increasingly favor workers with a 4-year college degree over other workers.

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One of the prominent questions in the late 1980s was whether workers would be available in sufficient numbers to meet the seemingly heightened job skill requirements of employers. With the unemployment rate in the 1988-1990 period averaging below 6% annually, the specter was raised of a labor shortage generally. Simultaneously, concern was expressed about the build-up of an excess supply of low-skilled workers relative to their reportedly dwindling job opportunities over the years.[1]

After an initially slow rebound from the 1990-1991 recession, the unemployment rate fell below 5% in 1997 and has remained at that level for the past few years. As a consequence, the Federal Reserve Board has been concerned that an overall shortage of workers could brake the long-running economic expansion by preventing firms from continuing to fulfill the demand for goods and services in a low-inflation environment.[2] At the same time, the focus of Congress has been on whether there are enough workers at the high *and* the low end of the skill spectrum to meet employers' demand for labor (e.g., information technology and farm workers, respectively).[3]

Nonetheless, the perception of limited job options for low-skilled workers has continued to command attention (albeit muted). The cautionary remarks of several policy analysts that welfare recipients would be unable to meet the work requirements in reform legislation enacted in 1996 have given way today to fear that, once the economy sputters, these individuals will be the first to be laid off and will then face

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[1] See, for example, Johnston, William B., and Arnold B. Packer. *Workforce 2000: Work and Workers for the Twenty-first Century*. Washington, D.C., U.S. Govt. Print. Off., 1987.; Commission on Workforce Quality and Labor Market Efficiency. *Investing in People: A Strategy to Address America's Workforce Crisis*, volumes I and II. Washington, D.C., U.S. Govt. Print. Off., 1989; and, Commission on the Skills of the American Workforce. *America's Choice: High Skills or Low Wages*. Rochester, NY, National Center on Education and Economy, 1990. **Note:** In a sequel to *Workforce 2000* (Judy, Richard W. and Carol D'Amico. *Workforce 2020: Work and Workers in the 21st Century*. Indianapolis, Indiana, Hudson Institute, 1997), the authors acknowledged that low-skilled jobs are not actually going to disappear because of the distinction between new jobs and existing jobs which open up as employees retire or leave their positions for other reasons. *Worforce 2000* largely focused on new job growth. This important distinction will be discussed later in this CRS report.

[2] CRS Report RL30283, *The Unemployment Rate and the Potential Supply of Labor*, by Linda Levine.

[3] For more information see CRS Report RL30140, *An Information Technology Labor Shortage? Legislation in the 106th Congress*, and CRS Report RL30395, *Farm Labor Shortages and Immigration Policy*, both by Linda Levine.

few choices for reemployment due to their typically brief work experience and low skill levels. Others in the public policy community have continued to debate whether the influx of immigrants with little schooling has exacerbated low-skilled native-born workers' already poor employment and wage options.[4]

Those who believe there is an ongoing mismatch between the skill composition of the workforce and the skill requirements of jobs have urged individuals to obtain additional education or training to improve their chance of succeeding in the labor market.[5] For example, some Members of Congress have endorsed assisting students and workers in this endeavor through education tax credits and deductions or through increased funding of Pell grants and the Workforce Investment Act. Federal appropriations and income tax credits also have focused on providing training or work experience to welfare recipients, among others, with poor job prospects due to presumably low skill levels.[6] In addition, some have advocated the adoption of a more labor-market-oriented approach to immigration that would curtail the admission of persons having limited formal education to reduce competition with less skilled native-born workers.

This report examines whether employers have been increasing their demand for high-skilled workers and, at the same time, decreasing their demand for low-skilled workers. It does this by analyzing projected rates of occupational employment growth by education level between 1998 and 2008. The report determines whether the emerging pattern of job growth is likely to have much of an effect on the overall skill distribution of employment and on the number of jobs available to less skilled workers. It also distinguishes between jobs that are added to the labor market through economic growth (i.e., new jobs) and positions that become available to jobseekers due to occupational turnover (i.e., filling vacancies in existing jobs).

A Skill Hierarchy

Statistics are regularly collected on the educational distribution of workers employed in different occupations. Educational attainment by occupational group can serve as a rough approximation of a job's skill level. The Congressional Research Service (CRS) developed the skill hierarchy shown below from the distribution of

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[4] For more information see CRS Report 95-408, *Immigration: The Effects on Native-Born Workers*, by Linda Levine; and CRS Report 95-1210, *Immigrant Skills: Trends and Policy Issues*, by Ruth Ellen Wasem and Linda Levine.

[5] Indicators of success in the labor market include an individual experiencing relatively little unemployment or relatively high wages. Generally, workers with more schooling are less likely to become unemployed and are more likely to have higher earnings. See, for example, CRS Report 95-1081, *Education Matters: Earnings by Highest Year of Schooling Completed*, by Linda Levine. (Hereafter cited as CRS Report 95-1081, *Education Matters*.)

[6] CRS Report RS20134, *Welfare Reform: Welfare-to-Work Legislation in the 106th Congress*, by Christine Devere, and CRS Report RL30089, *Employment Tax Credits Expiring during the 106th Congress*, by Linda Levine.

educational attainment by occupational group of employed persons aged 16 or older according to the March 1999 Current Population Survey (CPS).

A Caveat

A major caveat that readers should keep in mind while they proceed through this report is that educational attainment was the sole criterion for slotting occupational groups in the hierarchy. However, employees often develop skills through formal on-the-job training programs (e.g., attending on-site classes) or through informal instruction (e.g., learning by watching others) rather than through additional years of formal education. For example, workers in some blue-collar occupations in the construction trades (e.g., heavy equipment operators and electricians) may participate in apprenticeships and workers whose jobs now commonly require computer skills (e.g., professional and administrative support employees) may participate in employer-provided training to use word-processing or spreadsheet software. The allocation of occupations to the hierarchy does not reflect job skills acquired outside of school settings because of scanty data on employer-provided training.[7]

The Hierarchy's Structure

The four skill levels of the hierarchy are based on the following educational distributions by occupational group.

- A near majority (at least 46%) of workers in the occupations that make up the *highest skilled* group had earned a bachelor's or higher degree.
- A majority of workers in the occupations that comprise the *moderately high-skilled* cluster had some postsecondary education.
- A majority of workers in the two lower skilled groups had at most completed high school.
  a) In the *moderately low-skilled* cluster, a substantial portion (about 40%) of workers had not gone beyond high school.
  b) In contrast, many workers in the *lowest skilled* cluster had not attended high school (e.g., 25% of farmworkers, 19% of private household workers and 13% of cleaning service workers did not go beyond elementary school).

See **Table 1**.

[7] For more information see CRS Report RL30546, *Employer-Provided Training*, by Linda Levine.

Table 1. Skill Hierarchy based on the Distribution of Educational Attainment by Occupational Group

Educational attainment	Occupational composition
Highest	Executive, administrative and managerial workers
	Professional specialty workers
	Technicians/technologists excluding heath, engineering and science (e.g., computer programmers, legal assistants, and aircraft pilots)
	Financial and business services, insurance and related sales agents
Moderately high	Health, engineering and science technicians/technologists (e.g., licensed practical nurses and electrical/electronic technicians)
	Marketing and sales worker supervisors
	Administrative support workers, including clerical
	Protective service workers (e.g., guards, police, and firefighters)
Moderately low	Personal service workers (e.g., child care workers, personal care and home health aides, and hairstylists and cosmetologists)
	Health service workers (e.g., nursing aides, orderlies and attendants)
	All other service workers not elsewhere classified
	Precision production, craft and repair workers (e.g., carpenters, electricians, auto mechanics, and machinists)
	Farmers and farm managers
Lowest	Retail sales persons, cashiers, counter clerks and other sales workers not elsewhere classified
	Private household workers (e.g., cleaners and child care workers)
	Food preparation and service workers (e.g., cooks and waitresses)
	Cleaning and building service workers, except private household
	Operators, fabricators and laborers (e.g., sewing machine and packaging/filling machine operators, welders, truck drivers, and hand packers/packagers)
	Farmworkers and related agricultural workers (e.g., landscaping and groundskeeping laborers)
	Forestry, fishing and related workers (e.g., veterinary assistants and nonfarm animal caretakers, fishers, and timber cutters)

Projected Job Growth by Skill Level

Forty-one percent (8.3 million) of the 20.3 million jobs the U.S. Bureau of Labor Statistics' (BLS) estimates will be added to the labor market over the 1998-2008 projection period could be in the highest skilled cluster of occupations.[8] Another one-fifth (4.0 million) of new jobs could fall in the moderately high-skilled category. Taken together, then, jobs requiring a fairly high skill level could account for 3 out of every 5 new jobs created between 1998 and 2008. (See **Table 2**, columns 4 and 6.)

Almost one-fourth (4.7 million) of jobs resulting from economic growth over the 10-year projection period could lie in the moderately low-skilled cluster of occupations. Another 16% (3.3 million) of new jobs could be added to the lowest skilled category. *Thus, employers are expected to continue to need workers from a variety of educational backgrounds for the new jobs created during the first decade of the 21st century*.

Highest Skilled Category

The most rapid growth (22%) among the four categories in the hierarchy is expected to occur in the highest skilled occupations. All of the occupational groups that make up the highest skilled cluster are projected to grow at above the average rate (14%). Within the highest skilled cluster, professional and technical (excluding health and engineering/science) jobs could experience the relatively largest expansion (27%) over the projection period. (See **Table 2**, column 5.)

Regardless of skill category, computer-related professional positions are estimated to be the fastest growing (i.e., computer engineers, 108%; computer support specialists, 102%; systems analysts, 94%; and database administrators, 77%). Except for database administrators, these also are among the occupations projected to post the largest absolute increases in employment (i.e., systems analysts, 577,000; computer support specialists, 439,000; and computer engineers, 323,0000).[9]

In the technicians (excluding health and engineering/science) group, paralegal and legal assistants (62%) and computer programmers (30%) are projected to grow at well above the all-occupations' average rate (14%). It is anticipated that computer programmers also will be among those occupations reporting the greatest absolute job growth (191,000) between 1998 and 2008.[10]

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[8] The U.S. Bureau of Labor Statistics developed the projections. CRS used the skill hierarchy it developed to group employment by occupation in 1998 and 2008.

[9] Braddock, Douglas. Occupational Employment Projections to 2008. *Monthly Labor Review*, November 1999. (Hereafter cited as Braddock, *Occupational Employment Projections to 2008*.)

[10] Braddock, *Occupational Employment Projections to 2008*.

Table 2. Actual and Projected Employment by Occupational Skill Cluster, 1998 and 2008

Occupational skill cluster	Employment (000)		Employment change		% Distribution of employment change
	1998	2008	Number (000)	%	
Total, all occupations	140,514	160,795	20,281	14	100
High-skilled occupations	36,840	45,098	8,258	22	41
Executive, administrative, and managerial workers	14,770	17,196	2,426	16	12
Professional specialty workers	19,802	25,145	5,343	27	26
Technicians, excluding health and engineering and science	1,152	1,460	308	27	2
Financial and business services, insurance, and related sales workers	1,116	1,297	181	16	1
Moderately high-skilled occupations	33,612	37,580	3,969	12	20
Health technicians and technologists	2,447	3,063	616	25	3
Engineering and science technicians and technologists	1,351	1,525	175	13	1
Marketing and sales worker supervisors	2,584	2,847	263	10	1
Administrative support, including clerical workers	24,461	26,659	2,198	9	11
Protective service workers	2,769	3,486	717	26	4
Moderately low-skilled occupations	35,235	39,965	4,731	13	23
Retail sales persons, cashiers, and sales workers not elsewhere classified	11,641	13,483	1,842	16	9
Health service workers	2,309	2,984	676	29	3
Personal service workers	2,934	3,828	894	31	4
All other service workers not elsewhere classified	1,249	1,490	241	19	1
Precision production, craft and repair occupations	15,619	16,871	1,252	8	6
Farm operators and managers	1,483	1,309	-174	-12	-1

Occupational skill cluster	Employment (000)		Employment change		% Distribution of employment change
	1998	2008	Number (000)	%	
Low-skilled occupations	34,826	38,151	3,324	10	16
Private household workers	928	751	-178	-19	-1
Food preparation and service workers	8,735	9,831	1,096	13	5
Cleaning and building service workers, excluding private household	3,623	4,031	408	11	2
Operators, fabricators and laborers	18,588	20,341	1,753	9	9
Farmworkers, forestry and fishing workers, and related workers excluding farmers and managers	2,952	3,197	245	8	1

Source: Created by the Congressional Research Service from U.S. Bureau of Labor Statistics' data.

Note: Numbers may not add to totals due to rounding.

Moderately High-Skilled Category

Job creation in the moderately high-skilled cluster could be slightly below the average rate (i.e., 12% versus 14%), in large part because of its inclusion of the administrative support group. The continuing dissemination of technological innovations appears to be primarily responsible for the slow job growth (9%) in numerous administrative support occupations. Nonetheless, administrative support is expected to remain the largest occupational category — although in 2008, its lead over the professional group could narrow considerably (to 1.5 million jobs). (See **Table 2**, columns 3 and 5.)

Office automation resulting in productivity improvements as well as managers' and professionals' now common use of computer software is expected to mean fewer jobs for typists and word processors in 2008 (down by 93,000 or 20%). The spreading application of office automation also is expected to reduce the demand for labor in financial records processing occupations such as bookkeeping, accounting and auditing clerks (-81,000 or -4%) as well as for bank tellers (-31,000 or -5%). In addition, BLS projects that the need for computer operators will decline by 64,000 or 26% as automation reaches the "computer room" itself (e.g., programs and robots that allow computers to perform routine tasks once handled by people) and as firms move away from the large mainframes that these employees operate. Continuing technological change and organizational restructuring (e.g., mergers) in the telecommunications industry could cut employment of telephone operators by 41,000 or 16%, as well.[11]

The inclusion in the moderately high-skilled cluster of health technicians and technologists (e.g., medical records technicians and surgical technologists) and of protective service workers (e.g., correctional offices and police) offsets the relatively slow pace of job growth in administrative support occupations between 1998 and 2008. However, the above-average increases in employment projected for health technicians/technologists (25%) and for protective service workers (26%) could account for just 3% and 4%, respectively, of all new jobs created over the period because of the occupational groups' small employment bases. In contrast, despite the slow employment growth projected for administrative support jobs, they could expand by 2.2 million and account for 11% of all jobs added to the labor market due to the occupational group's large employment base. (See **Table 2**, columns 4 and 5.)

The Two Lower-Skilled Categories

The heterogenous composition of the two lowest skilled clusters also has an impact on their anticipated growth rates of 13% for the moderately low-skilled group and of 10% for the lowest skilled group. The inclusion of farming occupations and of blue-collar occupations (i.e., precision production, craft and repair workers; and operators, fabricators and laborers) is expected to dampen the two skill categories' rates of expansion. Conversely, the inclusion of service and retail occupations shores up the projected pace of employment gains in the two lower skilled groups. (See **Table 2**, column 5.)

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[11] Braddock, *Occupational Employment Projections to 2008*.

Contracting Job Opportunities. Reflecting the continuing employment decline in the agricultural sector of the economy,[12] farmers (classified in the moderately low-skilled group) and farmworkers (classified in the lowest skilled group) are projected to be among the occupations experiencing the largest absolute decreases (down 173,000 jobs or 13% and 57,000 jobs or 7%, respectively).[13]

Similarly, cutbacks at sewing and textile manufacturers[14] are expected to largely account for the dwindling prospects of workers in some blue-collar occupations. Within the lowest skilled category, for example, sewing machine operators in the garment trade could experience a 112,000 job loss (or 30% reduction) and operators/tenders of certain textile machines, a 50,000 job loss (or 26% reduction).[15] Growing reliance on computer-controlled technology appears to explain more of the projected employment declines among other blue-collar occupations. In the moderately low-skilled group, the number of positions for precision inspectors, testers and graders could fall by 22,000 or 3% for example. Blue-collar jobs in the printing/publishing industry also could suffer employment contractions associated with computer technologies: in the lowest skilled group, offset lithographic press operators could lose 9,000 jobs (a 15% cutback) and typesetting/composing machine operators/tenders, 8,000 jobs (a 60% cutback); in the moderately low-skilled group, the number of printing film strippers could drop by 8,000 or 33%.[16]

Despite these and other absolute decreases in some blue-collar fields, total employment of blue-collar workers is projected to grow — by 8% for precision production, craft and repair occupations in the moderately low-skilled group; and by 9% for operators, fabricators and laborers in the lowest skilled group. Given the substantial numbers of blue-collar jobs currently in existence, these relatively low growth rates could add 3.0 million jobs and account for 15% of all new jobs created between 1998 and 2008. (See **Table 2**, columns 4, 5 and 6.)

In contrast, the experience of private household workers is expected to be more like that of farmers and farmworkers, and less like that of other service workers (see below). In other words, employment in the private household occupational group is expected to continue its downward trajectory. Both child care workers and cleaners/servants who work in private homes are among the occupations that could

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[12] Employment in the agricultural industry is projected to fall by 377,000 jobs between 1998 and 2008, following a decline of 186,000 between 1988 and 1998. Thomson, Allison. Industry Output and Employment Projections to 2008. *Monthly Labor Review*, November 1999. (Hereafter cited as Allison, *Industry Output and Employment Projections to 2008*.)

[13] Braddock, *Occupational Employment Projections to 2008*.

[14] Employment in the apparel industry is projected to decrease by 197,000 jobs between 1998 and 2008, following a loss of 341,000 between 1988 and 1998. Employment in the textile mill products industry could fall by 97,000 over the 1998-2008 projection period in addition to a 130,000 job cutback recorded in the prior 10 years. Allison, *Industry Output and Employment Projections to 2008*.

[15] Braddock, *Occupational Employment Projections to 2008*.

[16] *Ibid*.

incur the heaviest job losses through 2008 (97,000 or 32% and 71,000 or 12%, respectively).[17]

Expanding Job Opportunities. The aging of the population likely contributes to the robust job gains projected for health and personal service occupations in the moderately low-skilled cluster. The number of medical assistants could increase by 58% (or 146,000), physical therapy assistants/aides by 44% (or 36,000), dental assistants by 42% (or 97,000) and nursing aides/orderlies/attendants by 24% (or 325,000) during the projection period. Similarly, employment of personal care and home health aides — spurred, in part, by the shift toward outpatient and home care — is projected to rise by 58% (or 433,000). In addition, the continuing presence in the labor force of mothers with young children probably underlies the anticipated 26% (or 236,000) increase in child care jobs.[18]

One set of occupations in the moderately low-skilled group that has only a slightly above-average projected growth rate could add more jobs than some of the fast-growing occupations because of its large employment base. Specifically, 13.5 million individuals worked as retail sales persons, cashiers and other sales workers in 1998. If their employment increases by 1.8 million as projected, 9% of the total job gains between 1998 and 2008 would occur in these sales occupations. (See **Table 2**, columns 4, 5, and 6.) Expansion in the retail trade industry (e.g., department or discount merchandise stores) will likely account for much of the employment uptick in retail sales occupations during the projection period.[19]

Growth in the eating/drinking places component of the retail trade industry also could spur large employment gains in food preparation and service occupations (e.g., waiters/waitresses with 303,000 jobs as well as food counter, fountain and related workers with 247,000 jobs). Another service occupation — janitors and cleaners — could expand greatly as well (365,000 jobs).[20]

Changes in the Share and Number of Jobs by Skill Level

Despite their different rates of projected job growth, the skill clusters' shares of total employment are likely to remain about the same. As shown in **Table 3**, the highest skilled category of occupations accounted for 26% of all jobs in 1998; by 2008, the proportion could rise very modestly to 28% of the total. Both the moderately high-skilled group and the lowest skilled group could experience a very slight erosion in their shares of jobs over the projection period, from 24% to 23% for the moderately high-skilled group and from 25% to 24% for the lowest skilled group. In contrast, the moderately low-skilled group is expected to remain at 25% of total

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[17] *Ibid*.

[18] *Ibid*.

[19] Employment across the entire retail trade industry is projected to expand by 3.1 million jobs, somewhat less than the 3.3 million job gain in the 1988-1998 period. Allison, *Industry Output and Employment Projections to 2008*.

[20] Braddock, *Occupational Employment Projections to 2008*.

employment. *This stable pattern reflects the fact that the **new** jobs induced by economic growth (20.3 million) represent a small increment to the very sizable, existing employment base (140 million in 1998).*

Table 3. Distribution of Employment, 1998 and 2008

Occupational skill cluster	1998	2008
All occupations	100%	100%
High	26	28
Moderately high	24	23
Moderately low	25	25
Low	25	24

Source: Created by CRS from BLS data.

New jobs are not the only ones available to jobseekers. Firms hire employees for positions in both growing and shrinking occupations because many *existing* jobs must be filled when workers move from one occupation to another, retire or otherwise leave the labor force. Indeed, BLS expects that in most occupations more openings will develop because of hiring to fill jobs vacated between 1998 and 2008 than because of new jobs created by economic growth over the period.[21]

The need to replace workers is an especially important source of labor demand in slow-growing occupations, and the only source of job openings in declining occupations. For example, the lowest skilled cluster could add 3.3 million new jobs between 1998 and 2008, but the number of positions available to the least skilled workers could be considerably larger — a total of 14.1 million jobs. (See **Table 4**.) The 10.8 million difference between the two employment figures is "replacement needs," that is, employers hiring workers into existing jobs that become vacant due to employee mobility. While workers with the fewest years of education seemingly would be qualified to compete for just 16% of the 20.3 million *new* jobs added to the economy through 2008, they could have the skill requirements to fill 26% of the 55.0 million *new and existing* jobs expected to open up during the projection period. (See the **Appendix Table** for a comparison of job growth and total job openings for each of the skill hierarchy's occupational groups.)

Thus, the job opportunities available to newcomers to and current participants in the labor force are not limited to the change in employment generated by economic growth. Too great a focus on rates of job growth creates a misperception about how rapidly the skill structure of employment is changing and about the job market faced by low-skilled workers. The skill composition of new and existing jobs that will continue into the future should be examined to develop a complete picture of the nature of employers' skill requirements. *Despite the concentration of new jobs in the*

[21] Braddock, *Occupational Employment Projections to 2008*.

highest skilled occupational cluster, it appears that workers with a high school degree or less will continue to be in considerable demand during the first decade of the 21st century. Specifically, while 41% of all new positions created between 1998 and 2008 could require workers to have at least a bachelor's degree, 52% of all jobs that open up during the period could be available to workers with a high school education at most. (See **Table 4**.)

Table 4. Job Growth and Total Job Openings by Skill Cluster, 1998-2000

Occupational skill cluster	Employment change[a]		Total job openings[b]	
	Number (in 000)	Percent distribution	Number (in 000)	Percent distribution
All occupations	20,281	100	55,008	100
High	8,258	41	15,367	28
Moderately high	3,969	20	11,359	21
Moderately low	4,731	23	14,149	26
Low	3,324	16	14,133	26

Source: Calculated by CRS from BLS data.

Note: Numbers may not add to totals due to rounding.

[a] Employment change reflects the number of new jobs created by economic growth.
[b] Total job openings reflects the number of new jobs created by economic growth **and** the number of existing jobs employers are expected to fill as the jobs are vacated by workers moving into other occupations, retiring or permanently leaving the labor force for other reasons (i.e., net replacement needs).

Conclusion

The skill structure of employment is likely to remain quite stable through 2008. Employers are demanding a more highly educated labor force, but they also continue to need workers across the entire skill spectrum. Too great a focus on the rate of new job creation due to economic growth — without regard to the current size and composition of employment as well as to the number and nature of jobs generated by occupational turnover — results in a misperception about the speed and extent of change in the skill structure.

As defined in this report, low-skilled jobs are not disappearing. Many occupations with limited educational requirements are experiencing above-average rates of job growth or substantial increases in employment levels. Consequently, jobs that typically require a high school diploma or less could continue to account for about one-half of total employment in 2008, just as they did in 1998. And, in relatively slow-growing or declining occupations, many jobs are expected to become

available to low-skilled jobseekers because employers will need to fill vacancies created by departed employees.

Oftentimes, members of the education and training community have focused on those occupations expected to grow the most rapidly to urge students to obtain a bachelor's degree or, at the least, get postsecondary education that leads to an associate's degree or vocational certificate. This analysis demonstrates that jobs will continue to be there in abundant numbers for workers with no more than a high school education, that is, the report addresses the employment prospects of relatively low-skilled workers. In terms of wage prospects, however, firms have been paying a much larger premium than in the past to employees with bachelor's degrees.[22] The substantial widening of the wage gap between more and less educated workers suggests that there is something in addition to the barely perceptible shift toward heightened job skill requirements (as measured by educational attainment) that has prompted employers to increasingly favor workers with a 4-year college degree over other workers. Perhaps firms are more generously rewarding employees who have attained bachelor's degrees because they believe this indicates that these workers have the ability to more easily learn competencies that may be added to jobs over time (e.g., using ever-evolving technologies) or to more readily adjust to organizational restructuring (e.g., having attributes that enable them to function well in a team environment).

> With so little understanding of why the demand for education is behaving as it is, and with no discernible shift toward occupations that require higher literacy or education, we need to be cautious about predicting the future. About all we can say is that in the recent past earnings of college graduates have exceeded earnings of those with less education by wide margins.[23]

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[22] On average, the wage gap between male college and high school graduates widened from about 33% to 48% between the latter half of the 1970s and 1998. The average wage gap between female college graduates and female high school graduates grew from about 29% to 43% over the same period. CRS Report 95-1081, *Education Matters*.

[23] Barton, Paul E. *What Jobs Require: Literacy, Education, and Training, 1940-2006*. Princeton, NJ, Educational Testing Service, January 2000. p. 35.

Appendix Table. Job Growth and Total Job Openings by Occupations Within the Skill Clusters, 1998-2008

Occupational skill cluster	Employment change[a]		Total job openings[b]	
	Number (in 000)	Percent distribution	Number (in 000)	Percent distribution
Total, all occupations	20,281	100	55,008	100
High-skilled occupations	8,258	41	15,367	28
Executive, administrative, and managerial workers	2,426	12	5,107	9
Professional specialty workers	5,343	26	9,249	17
Technicians, excluding health and engineering and science	308	2	635	1
Financial and business services, insurance, and related sales workers	181	1	376	1
Moderately high-skilled occupations	3,969	20	11,359	21
Health technicians and technologists	616	3	1,124	2
Engineering and science technicians and technologists	175	1	492	1
Marketing and sales worker supervisors	263	1	601	1
Administrative support, including clerical workers	2,198	11	7,652	14
Protective service workers	717	4	1,490	3
Moderately low-skilled occupations	4,731	23	14,149	26
Retail sales persons, cashiers, and sales workers not elsewhere classified	1,842	9	5,833	11
Health service workers	676	3	1,064	2
Personal service workers	894	4	1,413	3
All other service workers not elsewhere classified	241	1	546	1
Precision production, craft and repair occupations	1,252	6	5,061	9

Occupational skill cluster	Employment change[a]		Total job openings[b]	
	Number (in 000)	Percent distribution	Number (in 000)	Percent distribution
Farm operators and managers	-174	-1	232	0
Low-skilled occupations	3,324	16	14,133	26
Private household workers	-178	-1	276	1
Food preparation and service workers	1,096	5	5,159	9
Cleaning and building service workers, excluding private household	408	2	1,164	2
Operators, fabricators and laborers	1,753	9	6,369	12
Farmworkers, forestry and fishing workers, and related work excluding farmers and managers	245	1	1,165	2

Source: Created by the Congressional Research Service from U.S. Bureau of Labor Statistics' data.

Note: Numbers may not add to totals due to rounding.

[a] Employment change reflects the number of new jobs created by economic growth.
[b] Total job openings reflects the number of new jobs created by economic growth **and** the number of existing jobs employers are expected to fill as the jobs are vacated by workers moving into other occupations, retiring or permanently leaving the labor force for other reasons (i.e., net replacement needs).