WHITE PAPER

SKILLS REQUIREMENTS FOR TOMORROW'S BEST JOBS Helping Educators Provide Students with Skills and Tools They Need

Sponsored by: Microsoft

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October 2013

IDC OPINION

Local, state, and even national education leaders are charged with developing and administering educational curricula to best prepare our children and students for their future. Yet there can be tension between a curriculum that develops a "well-rounded" student and a curriculum that helps create a student who is "job or career ready."

Most specifically, IDC has observed the use of technology in the classroom as an object of study or as a way to artificially capture and retain a student's attention by alluding to a path to postscholastic success. Unfortunately, this approach has the potential to take valuable class time away from common and widely valuable experiences that students need more.

IDC research suggests that skills and competencies that support a well-developed, civically competent student are the same skills that will be widely in demand by employers in 2020 and beyond. IDC analyzed 14.6 million job postings to identify the top skills required for the positions expected to have the highest growth and wages between now and 2020. These positions represent a set of common, core skills focused on "soft" skills such as oral and written communication skills, attention to detail, and problem-solving ability.

IDC uncovered a subset of soft skills focusing on communication, integration, and presentation (CIP) skills, which are overwhelmingly desirable in high-growth, high-wage occupations. Further, Microsoft Office was the only software package to appear among the top 20 skills required for these high-growth/high-salary positions, coming in at number 3 on the list, and was cited as a required skill more than five times as often as other, non-Microsoft software. Our analysis also shows the following:

- High school students require "job readiness" and not "job training" for success.
- The value of proficiency in common, frequently required skills is increasing.
- Focus on real-world tasks like CIP capabilities fosters both a well-rounded student and a student whose skills will be in demand in our future economy.

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IN THIS WHITE PAPER

This IDC white paper presents research that forecasts the most "in demand" skills and competencies in 2020. Those skills, widely considered as "soft" skills, are commonly reflected in nearly all occupations but will be in particular demand in jobs that are both high growth and well above the median in salary potential.

To IDC, this means that an educational system that supports the development of these widely common and diverse skills not only supports the future success of the students who aspire to those positions but also foretells the future success of students across the academic continuum and in the broader, civic economy.

By leveraging job and skills requirements from 14.6 million job postings from the second and third quarters of 2013, IDC has identified the 20 most common skills required for those positions. To validate the importance of those skills, IDC examined the importance of those skills in the future job market by examining 60 positions that have both above-average growth potential and above-average salary potential between 2013 and 2020. These 60 positions alone will account for 11.5 million hirings and 28% of job growth between 2010 and 2020. We further illustrate the usefulness of those skills by examining how they are represented in four specific but diverse occupations that will have both high-growth and above-average salary potential.

Local, regional, and national educators can use this information to support specific and meaningful dialog about particular elements of a curriculum. In addition, they can be confident not only that these skills will be relevant in the future but also that the students who achieve these competencies will be highly sought-after contributors to the global economy for many decades.

SITUATION OVERVIEW

In 2004, the bipartisan, nonprofit organization Achieve Inc. reported in *Ready or Not: Creating a High School Diploma That Counts* that both employers and colleges expect a higher level of competence from high school graduates than they had in the past. According to the report, current high school exit expectations fall well short of employer and college demands. The report includes examples of this demand for higher-level competence and recommends that states and colleges "anchor academic standards in the real world."[1]

Nine years later, while education reform is high on the agenda of many political leaders and aspirants, academic experts, and even many corporate leaders and entertainment icons, there remains debate regarding the relevance and aspirations of school requirements.

Moreover, with the employment landscape changing, both in the United States and in the rest of the world, the situation of relevance and value does not appear to be getting any clearer.

[1] http://www.achieve.org/ReadyorNot

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Requirements in a Changing Employment Landscape

The fast-changing social, economic, and technology environments will continue to drive employers to seek job applicants with skills to better deal with customers; work in fluid, matrixed, and other complex environments; and accommodate evolving organizational cultures and the rapid introduction of new tools and approaches to successfully perform "work." A number of major megatrends will drive employer needs:

- **Increasingly diverse customer base.** Immigration and demographic changes and ethnic and cultural diversity are shifting economic power. Goods and services increasingly cater to interest, values, beliefs, and lifestyle — requiring recognition and sensitivity to alignment and misalignment of products and services.

- **Employee's relationship with employer.** Many trends reflect a changing relationship between employee and "paternalistic employer," including increased use of contingent, part-time, or temporary workers; increased use of remote workers or telecommuters; and increased use of outsourced workers, subcontractors, or "value-added supply chains" to move noncore work out of the enterprise to more specialized providers.

- **Increased complexity of business structures and organizations.** Mergers, regulatory requirements, globalization, and ever faster corporate "boom and bust" cycles are creating enterprises that are not only more flexible and arguably more nimble but also increasingly interdependent, complex, or even temporal.

- **Expanding mobile customers and increased electronic communication.** This is causing a changing relationship with the employee and the customer, and often creating opportunities for direct relationships between customers and employees.

- **Increasing economic importance of digital commerce and digital content.** The digitization of both routine and creative white-collar work not only has direct impact on the nature of employees and their work but also will indirectly but more profoundly increase the importance and relevance of more flexible organizational systems.

- **IT in the workplace.** A small, though growing, number of workers are purely focused on technology, but technology is making its way into an increasing number of jobs that are not IT focused, including logistics/inventory (with handheld devices for record keeping and QA), manual labor (for measuring, designing, and fabricating), medical and auto and appliance repair (for monitoring, diagnosis, and record keeping), and hospitality/food service (for inventory, customer service, and scheduling). The technologies that are used in each of the previously mentioned jobs are also supported by an IT infrastructure that will be increasingly important to the global economy.

While some of these trends are precipitated or facilitated by technology, the impact or response to these trends is not, for the most part, "technology focused" — and the impact on skills will certainly not be predominantly or even significantly technology related. The skill sets high school graduates must offer employers must span a wide range of organizational needs. Moreover, these trends don't seem to suggest a strong need to teach "technology for technology's sake."

To best forecast what those skills or organizational requirements might be, we must "anchor standards in the real world" and examine the set of common, core skills across the employment spectrum that will be important when children who are in high school, middle school, and grade school today are looking for work in 2020 and beyond.

Once those skills are identified, we must demonstrate that they are relevant not simply for the average job in 2020 but equally for those students who aspire to occupations with above-average demand and above-average salary expectations.

This assures stakeholders — educators, policymakers, and parents — that the skills requirements identified will be relevant to the most motivated, ambitious, and conscientious students, in addition to those with more modest aspirations.

FUTURE OUTLOOK

Tomorrow's Best Jobs

To understand the skills that will be required for high-growth/high-salary jobs in the future, one must first understand what those jobs are expected to be. To forecast the best jobs in 2020, IDC leveraged data from the U.S. Bureau of Labor Statistics (BLS). We analyzed employment data for 748 Standard Occupational Classifications (SOCs) — the U.S. equivalent of the International Standard Classification of Occupations (ISCO) — and ultimately selected the most attractive classifications according to three criteria:

- **Size.** To qualify, the occupation should have had at least 100,000 jobs in 2010.
- **Growth.** The occupation should grow by at least 100,000 jobs by 2020, or if it grows by fewer than 100,000 positions, then it must exhibit growth of 15% from its 2010 level. Categories were eliminated if they did not have at least 10% forecast growth.
- **Wages.** The occupation needed to have an average wage above the median U.S. wage.

The result was 60 occupations, which IDC grouped into 19 categories that represent high-growth and high-wage positions. These positions represent the most attractive occupations forecast through 2020 and include medical support and nursing; sales and marketing professionals; education, teaching, and instruction; computer programming and specialists; and office managers/business operations. These top 5 categories are projected to make up 53% of the high-growth/high-wage jobs and will account for 33.6 million positions in 2020 (see Figure 1). The current relevance of these occupations can be gauged by the employers that are currently posting these positions. On a recent weekday, more than 53,000 companies were looking to fill these high-growth/high-wage positions. The global companies posting these positions included financial services firms like Citi and Santander; consulting and accounting firms like Deloitte and PwC; manufacturers like General Dynamics, Lockheed Martin, and Raytheon Corporation; and retail giants like Home Depot and Advance Auto Parts, in addition to tens of thousands of local firms looking to fill important positions.

A complete list of the high-growth/high-wage occupations, including size, wage, and growth data, can be found in the Appendix.

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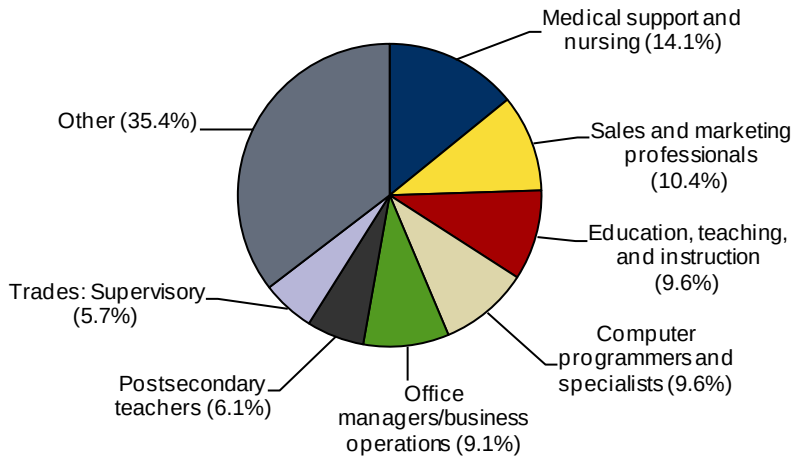
FIGURE 1

High-Growth/High-Wage Positions in the United States, 2020



Total = 33.6 million

Source: IDC, October 2013

The positions on IDC's high-growth/high-wage list account for only 8% of examined occupations, but they represent 20% of 2010 employment and are expected to account for 28% of new job openings through 2020. Further, the median salary is $69,179, which is 51% above the median U.S. salary for all occupations. A comparison of high-growth/high-wage occupations and all U.S. occupations is shown in Table 1.

The analyzed positions account for only 8% of examined occupations but for 28% of new job openings through 2020.

TABLE 1

Comparison of U.S. High-Growth/High-Wage Occupations and All Occupations

	High-Growth/High-Wage Occupations	All Occupations
2010 employment (000)	27,944	141,867
Job openings, 2010–2020 (000)	11,498	54,552
Growth in employment, 2010–2020 (000)	5,677	20,565
Growth in employment, 2010–2020 (%)	22.4	14.5
Average wage ($)	69,179	45,929

Source: U.S. Bureau of Labor Statistics and IDC, October 2013

Skills Requirements for Today and Tomorrow

IDC examined 14.6 million job postings between April and September 2013.

It is not enough merely to understand which occupations will be high growth and high salary; today's educators must impart the skills that will be required for those jobs, too. To determine those skills, IDC examined 14.6 million job postings between April and September 2013 from 25,000 job boards and staffing companies' corporate Web sites, supplied by WANTED Analytics, a provider of real-time business intelligence for the talent marketplace. This sample represents about 80% of all jobs posted during that period.

Our analysis uncovered a massive number of skills required to satisfy the 60 high-growth/high-wage occupations. More than 1,000 skills are needed for just those 60 occupations, and more than 12,000 job-specific skills are required across the more than 740 standard occupations. IDC attempted to identify the most common skills.

For this analysis, IDC examined the top 100 skills required for each of the positions on the high-growth/high-salary list, as well as the top 100 skills required across all U.S. occupations. The top skills required across all U.S. occupations are shown in Figure 2.

The most required skills across all occupations include oral and written communication skills, attention to detail, customer service focus, organizational skills, and problem-solving skills. It is notable that the only software package called out within the top 20 skills across all occupations is Microsoft Office: Microsoft Office is number 3 on the list of most required skills, and Microsoft PowerPoint and Microsoft Word are number 11 and number 13.

This set of 20 skills represents the most common, core skills a labor force can attain. This set is more important than any specific technology skills, deep science or math, or even great business skills. This set represents skills that are both important and widely required across positions. And though these skills are mostly "soft" skills, there are some technologies or "hard" skills on the list. These technologies are important because they are widely required capabilities across a broad range of occupations.

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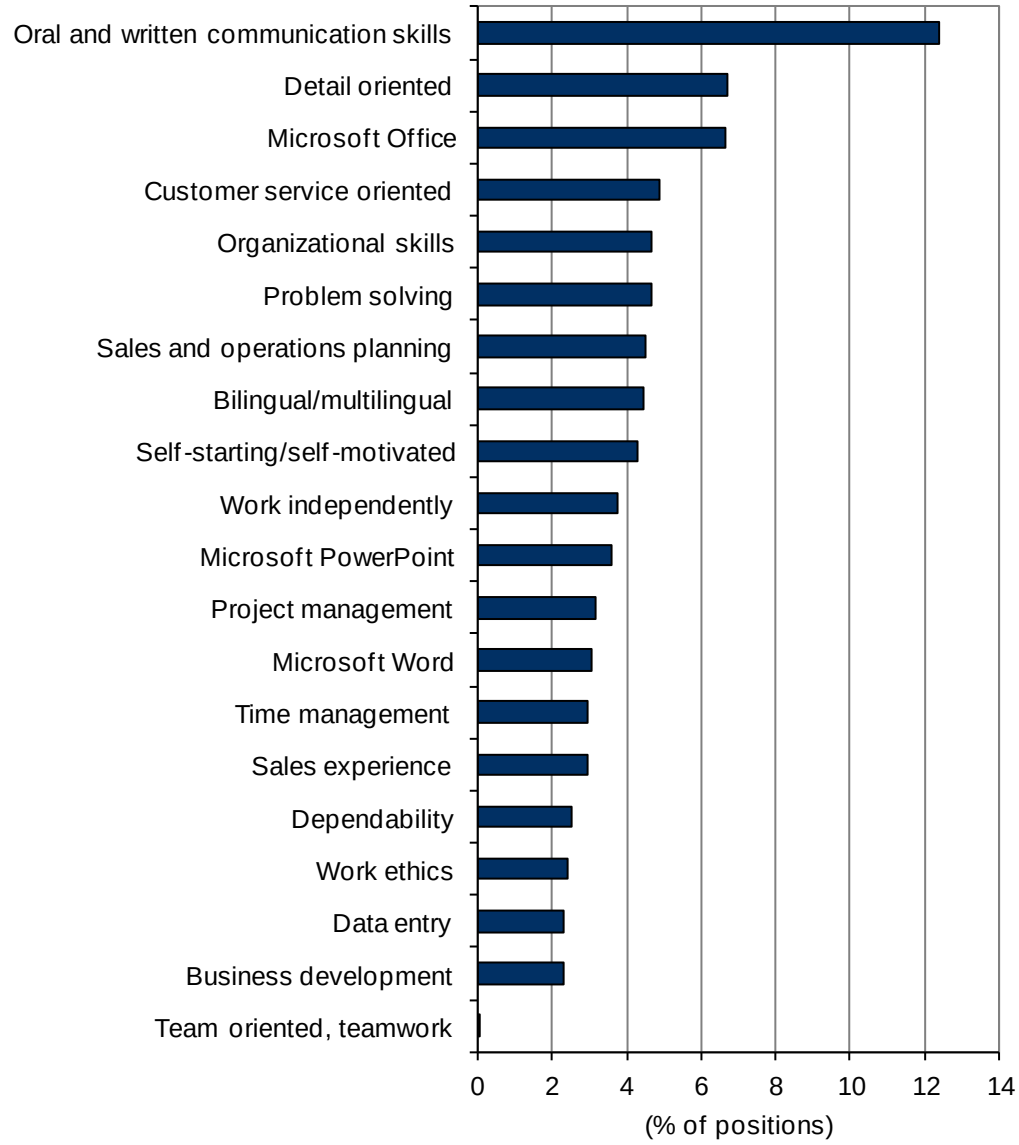
FIGURE 2

Top Skills for All U.S. Occupations



Source: IDC, based on WANTED Analytics and U.S. Bureau of Labor Statistics data, October 2013

Comparing Skills for All Jobs with Skills for High-Growth/High-Wage Occupations

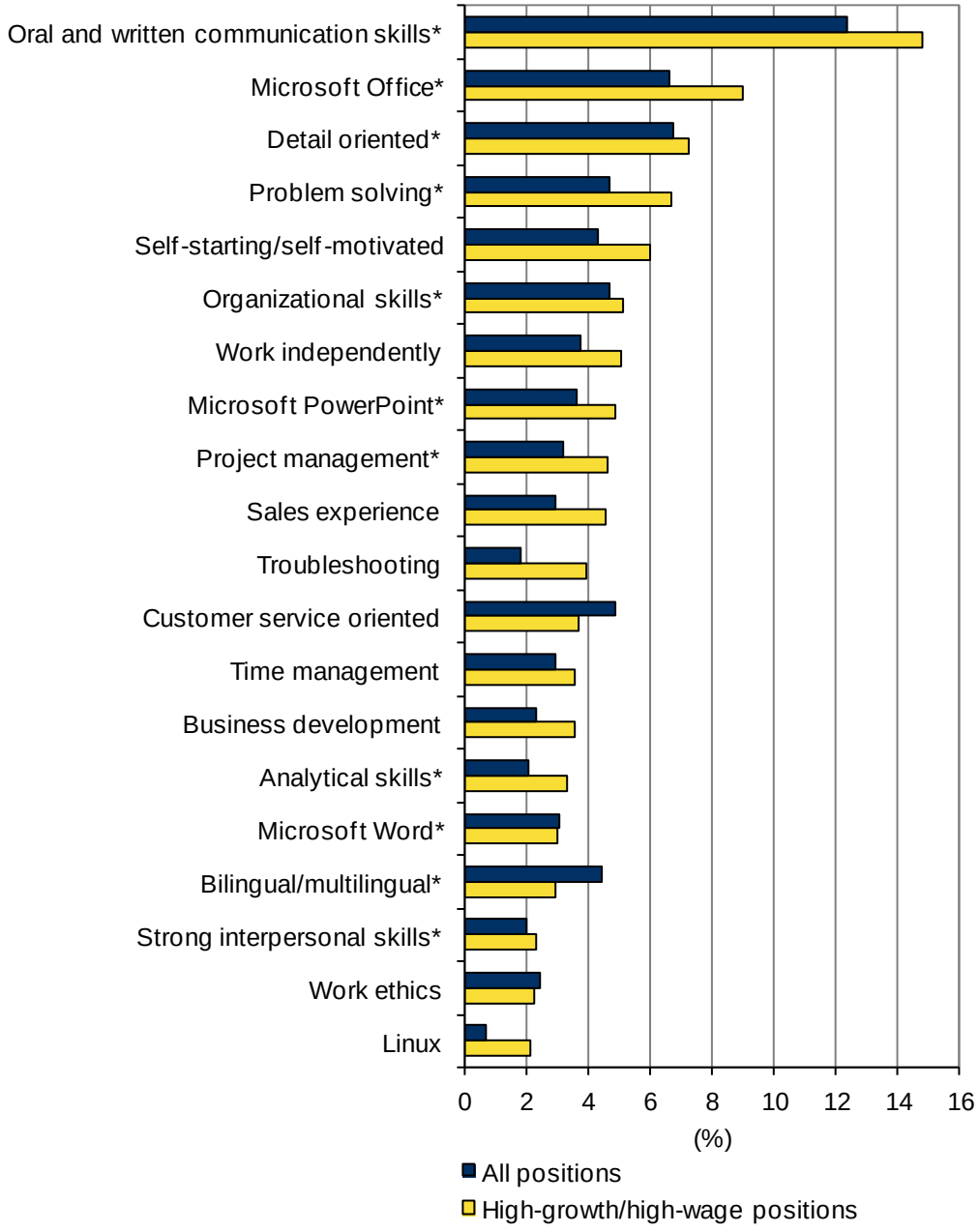
The skills list becomes even more interesting when one looks at the top skills required for high-growth/high-wage occupations (see Figure 3). There is a great deal of commonality between the top skills required for all positions and those required for high-growth/ high-salary positions. Sixteen of the top 20 skills are common between the two.

Further, even though most of the skills are common between the two lists, the top skills are generally required for more of the high-growth/high-salary positions than for all other positions. So while the skills required for high-growth/high-salary occupations are not

significantly different from the skills required for all occupations, the concentration in which those skills are required increases for nearly every skill. In other words, these common skills are pervasive across most jobs of tomorrow, but for high-growth jobs, these skills are equally common and more consistently required.

FIGURE 3

Comparison of Top Skills for High-Growth/High-Wage Occupations and All Occupations in the United States



* Indicates communication, integration, or presentation skill

Source: IDC, based on WANTED Analytics and U.S. Bureau of Labor Statistics data, October 2013

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Most Common Skills Are Cross-Functional; Occupation-Specific Skills Are Lower Incidence

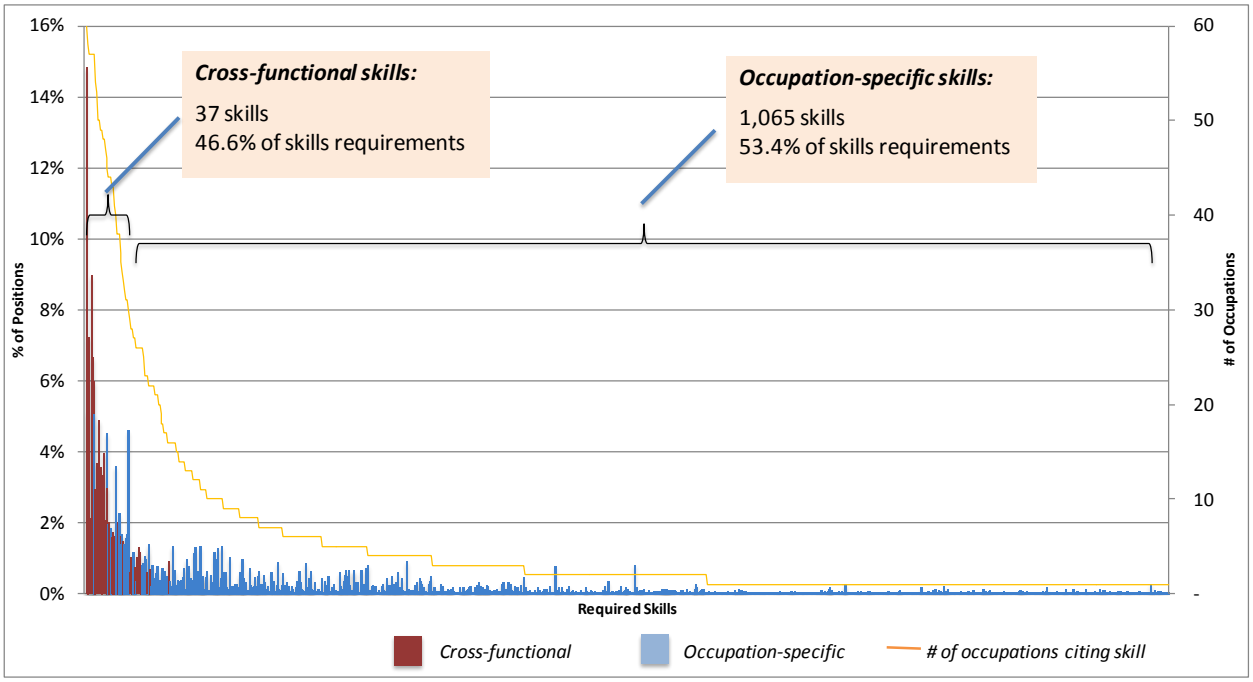
Most of the top skills are required by half or more of the high-growth/high-wage positions.

Another interesting finding is that most of the top skills are required by half or more of the high-growth/high-wage positions. These skills, which we refer to as "cross-functional," include oral and written communication, attention to detail, problem solving, and being self-starting/self-motivated.

In comparison, skills that are specific to individual positions such as programming skills, skills for healthcare or legal professions, and skills required for trades such as electrician and plumber are much less frequently required. IDC analysis shows that while only 37 cross-functional skills are required by half or more high-growth/high-wage occupations, they make up 46.6% of skills requirements for positions. In contrast, the 1,065 occupation-specific skills make up the remaining 53.4% of skills requirements (see Figure 4).

FIGURE 4

Frequency of Skills Mentions: Comparison of Cross-Functional Skills and Occupation-Specific Skills in the United States



Source: IDC, based on WANTED Analytics data, October 2013

This high concentration of cross-functional skills suggests that high school students require "job readiness" and not "job training" for success. The skills most needed for the best jobs cut across many occupations, so educators should consider focusing on the skills with the broadest applicability to success. In contrast, skills associated with specific occupations are less applicable for the broader occupation set, implying that they should receive less emphasis in general high school curricula.

Communication, Integration, and Presentation Skills

Of particular interest is a subset once described as "business skills"; however, because of their pervasiveness in all occupations, they should more accurately be described as communication, integration, and presentation skills. These skills broadly include the ability to seek, evaluate, and examine information and data; create a reasoned position; present findings; and make a case for or advocate for that position. These skills necessarily include both thinking and communicating competencies and often a facility with the tools and technologies that support those activities.

IDC found that CIP-related skills are required for about 40% of all job postings and about 70% of the positions that require at least one of the top 20 skills. CIP skills make up 11 of the top 20 skills required and are required for 39% of the fastest-growing, highest-paying positions. Note that IDC considers proficiency in Microsoft Office to be a CIP-related skill because Microsoft Office is a fundamental enabler for critical communication and presentation skills.

CIP-related skills are required for about 40% of all job postings and about 70% of the positions that require at least one of the top 20 skills.

Entrepreneurialism and Related Skills

Competitiveness and entrepreneurial skills are essential to future growth. They are necessary to prepare students for the changing workplace. While "entrepreneurial" as a specific skill was number 27 on the list of high-growth/high-salary skills, entrepreneurial-related skills were ranked much higher. For example, self-starting/self-motivated was the number 5 most frequently required skill for the high-growth/high-salary positions and the number 9 most frequently required skill for all positions.

Microsoft, Microsoft Office, and Other Software Skills

A large number of positions call for specific software skills. These positions span a broad range of categories, including technical/programming, management and administration, and financial/analytical. Microsoft Office was the most frequently required software skill and was explicitly required in 15% of high-growth/high-salary positions (see Figure 5). Other Microsoft software (such as SharePoint, Project, Access, and Visual Studio) was required in about 4% of high-growth/high-wage positions. Other (non-Microsoft) software was a required skill in 3% of high-growth/high-salary positions. Microsoft Office was cited as a required skill in high-growth/high-paying positions more than five times as often as all other, non-Microsoft software.

Microsoft Office was explicitly required in 15% of high-growth/ high-salary positions.

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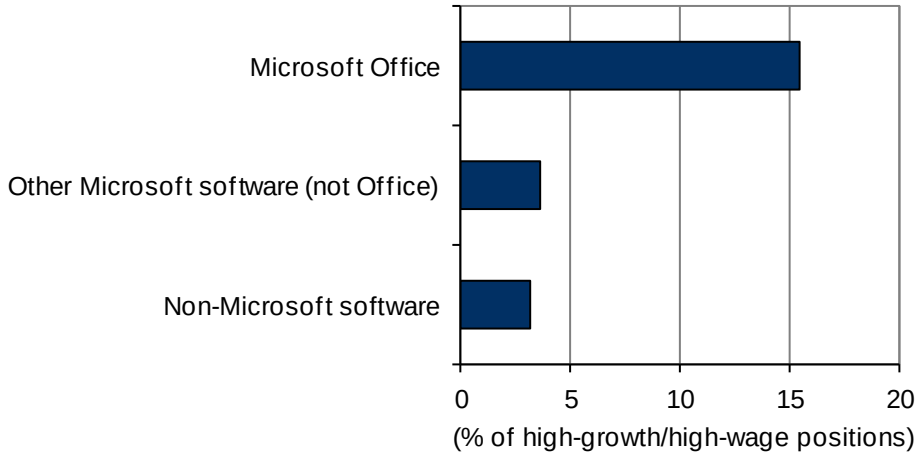
FIGURE 5

Explicit Software Skills Requirements for High-Growth/High-Wage Occupations in the United States



Source: IDC, based on WANTED Analytics data, October 2013

In a broader comparison, IDC also examined the number of high-growth/high-wage positions that call for "Microsoft Office–related" skills such as written/oral communication, analytical skills and financial analysis, word processing, spreadsheets, and financial reporting.

These skills may not explicitly call for knowledge of Microsoft Office, but knowledge of personal productivity software such as Microsoft Office can contribute to proficiency in those skills — such skills include word processing, data manipulation and analysis, and data/information presentation. Twenty-one percent of high-growth/high-wage occupations call for Microsoft Office–related skills, and when these positions are combined with positions explicitly requiring Microsoft Office, fully 29% of tomorrow's high-growth/high-wage positions require Microsoft Office or Microsoft Office–related skills.

Fully 29% of tomorrow's high-growth/high-wage positions require Microsoft Office or Microsoft Office–related skills.

Sample Skills Requirements for High-Growth/High-Wage Occupations

To demonstrate the degree to which requirements for cross-category soft skills, CIP skills, and Microsoft Office skills span a broad range of high-growth/high-wage occupations, IDC analyzed four high-growth/high-salary occupations: sales manager; educational counselor; nurse practitioner; and first-line supervisor of mechanics, installers, and repairers (see Figure 6). We chose these specific occupations because they represent a wide variety of positions and because they could be considered representative of the types of positions that will grow through 2020. While a number of skills are specific to individual positions, such as sales experience for sales managers and patient electronic medical records for nurse practitioners, cross-category soft skills make up half or more of the top 10 skills requirements for each of these four positions. Similarly, CIP skills including oral and written communication skills are in the top 5 in each category, and Microsoft Office or one of its components (Microsoft PowerPoint, Microsoft Word) is also among the top 10 skills required for each position.

FIGURE 6

Skills Requirements for Select High-Growth/High-Wage Occupations in the United States

Sales Managers

Rank	Skill	% of Positions
1	Sales experience	30.4
2	Business development	17.8
3	Sales management	15.6
4	Oral and written communication skills	15.2
5	Self-starting/self-motivated	12.8
6	Microsoft Office	11.9
7	Customer account management	11.9
8	Microsoft PowerPoint	9.9
9	Customer relationship management	8.8
10	Ability to travel	7.6

Educational Counselors

Rank	Skill	% of Positions
1	Oral and written communication skills	20.4
2	Microsoft Office	16.2
3	Work independently	10.1
4	Time management	9.5
5	Organizational skills	8.4
6	Detail oriented	7.3
7	Customer service oriented	6.4
8	Sales experience	6.1
9	Strong interpersonal skills	6.0
10	Problem solving	5.7

Nurse Practitioners

Rank	Skill	% of Positions
1	Oral and written communication skills	11.9
2	Patient electronic medical record	10.3
3	Administrative skills	5.6
4	Adaptability	5.3
5	Word processing	4.6
6	Microsoft Word	4.2
7	Work independently	3.8
8	Utilization review	3.2
9	Electronic medical record (EMR) systems	2.7
10	Quality assurance	2.3

First-Line Mechanical Supervisors

Rank	Skill	% of Positions
1	Troubleshooting	18.8
2	Preventive maintenance inspections	17.1
3	Sales and operations planning	16.6
4	Oral and written communication skills	14.3
5	Preventive maintenance	13.5
6	Microsoft Office	10.7
7	Electrical systems	7.5
8	Problem solving	6.6
9	Customer service oriented	6.2
10	Work order	5.6

Microsoft Office explicit/related CIP Cross-category

Source: IDC, based on WANTED Analytics data, October 2013

CONCLUSION

The economic forces influencing the job market are wide ranging and irresistible, but many of the important skills necessary for success in 2020 are visible and even common today.

- To compete for an increasingly diverse customer base, most enterprises will require a similarly diverse employee population to develop products for, effectively communicate with, and service those customers. Those same employees must be better equipped to work, reason, and communicate within a diverse employee population, too.
- To adjust to the changing relationship with employers, employees will need to be increasingly self-motivated, self-directed, and able to anticipate needs more quickly than in a more paternalistic work culture.

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- To function effectively in increasingly complex business structures and organizations, employees must become more comfortable with ambiguity, take initiative, and be able to work in a team-based environment.
- To better leverage and address the needs of an expanding mobile customer base, employers will increasingly select employees who can consistently demonstrate behaviors and attitudes that best reflect the corporate brand promise with only limited or infrequent guidance.
- To better utilize and benefit from digital commerce and digital content, employees will need to also be increasingly flexible to both identify opportunities and respond to market conditions.
- To support and utilize IT in the workplace, many positions will need the capacity to think beyond the specific task or job to the systemic implications of an action, inaction, or failure.

These pervasive trends, and the employee responses, suggest a set of common, core skills that students will need and benefit from throughout their working life and have implications for specific stakeholders.

Through 2020: Implications for Educators, Employers, and Tomorrow's Job Seekers

"Anchor Standards in the Real World"

This analysis strongly suggests that a small set of skills are overwhelmingly more "in demand" for current and future occupations — and those skills are not "job training" but are more reasonably described as "job readiness."

A small set of skills are overwhelmingly more "in demand" for current and future occupations.

Though clearly many capabilities and competencies must also be taught both to create a well-rounded student and as a foundation for those common skills, it seems that the debate over job training versus job readiness is not really a debate: The skills today's students need for tomorrow's positions are specific and important across a common set of high-growth/high-salary occupations.

The skills today's students need for tomorrow's positions are specific and important across a common set of high-growth/high-salary occupations.

This analysis doesn't attempt to identify the degree of math or language fluency necessary to be a functional member of society, but it clearly demonstrates that core skills, especially in communication, integration, and presentation, are overwhelmingly desirable in today's occupations and for those occupations with the highest-growth and above-average salary potential in 2020. The following sections offer some guidance for each of the core stakeholders in this debate.

Core skills, especially in communication, integration, and presentation, are overwhelmingly desirable for those occupations with the highest-growth and above-average salary potential in 2020.

For Educators

When choosing curricular content or objectives, educators should consider the set of common, core skills that employers will demand of students after they graduate. This needn't be as specific as job training. Instead, the skills we have identified as the "top 20" skills can be layered into many learning objectives. These top 20 skills include oral and written communication skills, problem solving, organizational skills, analytical skills, and strong interpersonal skills. In addition, these skills will continue to be relevant well beyond 2020.

Specifically, educators should consider increased attention on CIP skills. We haven't attempted to exhaustively document these skills or their individual importance, but taken as a whole, they provide a foundation of capabilities that will be widely applicable in future positions. CIP skills will include the ability to:

- Communicate by posing and responding to questions that probe reasoning and evidence (These skills include listening for a full range of opinions on a topic or issue; responding thoughtfully to diverse perspectives; synthesizing comments, claims, and evidence made on all sides of an issue; and determining what additional information or research is required to complete the task.)

- Integrate/synthesize multiple sources of information into a coherent understanding to make informed decisions and solve problems, evaluating the credibility and accuracy of each source

- Summarize, represent, and interpret data to form an opinion and defend a position, including the ability to make inferences and draw conclusions from observations, surveys, and experiments

- Use probability to evaluate outcomes of decisions

- Present information, findings, and supporting evidence, conveying a clear and distinct perspective, including the appropriate use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) to enhance understanding of findings, reasoning, and evidence

While a large number of positions require technical skills of one type or another, there is no consistent, broad-based requirement for heavily technical skills in either high-growth/high-salary positions or occupations overall. On the other hand, many skills benefit from knowledge of personal productivity applications. This suggests that as educators consider how to augment classroom instruction with technologies or to invest in applications that support ongoing achievement, decision makers should consider the value to the common, frequently required skills of being proficient with the tools that help support communication, integration, and presentation skills.

When purchasing software for use within the classroom, educators and school district leaders should consider both the current penetration of that software and its future position to ensure the decision is anchored in common or expected requirements.

Most importantly, establishing high-quality and valid assessments is essential to ensure any world-class "career ready" education outcome. Assessments will demonstrate students' mastery of material and help improve the teaching and learning process that supports that mastery. It is essential for education policymakers to facilitate linking real-world objectives and high-quality assessments to curricular materials in a way that does not "hijack" the instructional process or the intentions of the standards. Overall, an assessment program will include:

- Formative, summative, and interim adaptive assessments to engage both teachers and students (Students should be able to observe their progress, and teachers should be confident in the impact of their practices and behaviors in the classroom.)

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- Performance-based, real-world tasks to extend beyond the recitation of facts to the application of practice standards to demonstrate CIP capabilities

- Sufficient analysis and diagnostic capacity to provide student and teacher feedback on areas of improvement and approaches or techniques that are more likely to result in improved performance

- Appropriate technologies not only to facilitate consistent administration and evaluation of assessments but also as a platform for demonstrating core practices

For Employers

Employee readiness for an occupation is an ongoing challenge. However, in many cases, broad-based educational opportunities can be expected to provide only a portion of the skill and competencies any specific occupation requires.

New career aspirants will typically have only a small set of specific skills required to be successful in an occupation. Job training and ongoing career development must be high on the agenda of every manager and enterprise. Training required after a candidate/employee is hired augments, hones, and refines the skills of each new employee to best match the skills and competencies required for each unique position.

It is unrealistic to expect schools to prepare students for specific jobs or even a specific industry. To do so would require schools to prepare students for more than 740 occupations and more than 12,000 skills that might be outdated or out of favor by the time the students are eligible to enter the workforce. For effectiveness and efficiency, employers must assume the responsibility of training new career entrants in the job-specific skills the occupation requires.

For Today's Students/Future Job Seekers

Many jobs with both high-growth potential and above-average salary expectations require little more than a high school degree, including trades such as electrician, plumber, construction supervisor, building inspector, and loan agent and even many sales roles, but it is notable that the largest categories in the high-growth/high-wage occupations list — those expected to represent the largest number of jobs in 2020 — are higher-skilled positions in the medical, professional, teaching, and information technology areas.

These categories generally require at least an associate's degree, and most require a bachelor's degree or higher. The clear implication is that success in the job market of the future will continue to require investment in higher-level skills and schooling.

Overall

All stakeholders must be careful to avoid demanding the inclusion of technology in the classroom as an object of study. "Technology for technology's sake" satisfies only a very small percentage of future skills requirements.

While IDC believes that a very large percentage of skills and competencies can be enhanced or supported by the appropriate inclusion of technology in classrooms at all levels, it is beyond the scope of this research to suggest how to include technologies most effectively in all areas of instruction.

It is essential that instructional content, in-class expectations, assessments, and educational tools are all aligned to prepare students and assure stakeholders that the skills students learn in school will be relevant and valuable for all students.

LEARN MORE

Appendix: High-Growth/High-Wage Occupations

Table 2 contains additional detail regarding the high-growth/high-wage occupations list. Table 3 lists the skills IDC considered cross-functional skills, CIP skills, and Microsoft Office–related skills.

Figure 7 displays the growth in jobs for the high-growth/high-wage occupations and all other occupations.

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TABLE 2

High-Growth/High-Wage Occupations Categories in the United States

IDC Category	U.S. Bureau of Labor Statistics Category	2010 U.S. Positions (000)	2020 U.S. Positions (000)	Median Salary ($)	Education Level
Accountants	Accountants and Auditors	1,217	1,408	61,690	Bachelor's degree
Architects, Engineers, Logisticians	Civil Engineers	263	314	77,560	Bachelor's degree
	Architects, except Landscape and Naval	114	142	72,550	Bachelor's degree
	Logisticians	109	137	70,800	Bachelor's degree
Computer Programmers and Specialists	Computer Systems Analysts	544	665	77,740	Bachelor's degree
	Software Developers, Applications	521	665	87,790	Bachelor's degree
	Software Developers, Systems Software	392	519	94,180	Bachelor's degree
	Network and Computer Systems Administrators	347	444	69,160	Bachelor's degree
	Information Security Analysts, Web Developers, and Computer Network Architects	302	368	75,660	Bachelor's degree
	Computer Programmers	363	407	71,380	Bachelor's degree
	Database Administrators	111	145	73,490	Bachelor's degree
Computer Support	Computer Support Specialists	607	717	46,260	Some college, no degree

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High-Growth/High-Wage Occupations Categories in the United States

IDC Category	U.S. Bureau of Labor Statistics Category	2010 U.S. Positions (000)	2020 U.S. Positions (000)	Median Salary ($)	Education Level
Education Administration and Counselors	Education Administrators, Postsecondary	146	174	83,710	Master's degree
	Instructional Coordinators	140	167	58,830	Master's degree
	Educational, Guidance, School, and Vocational Counselors	281	335	53,380	Master's degree
Education, Teaching, and Instruction	Elementary School Teachers, except Special Education	1,477	1,725	51,660	Bachelor's degree
	Middle School Teachers, except Special and Career/Technical Education	642	750	51,960	Bachelor's degree
	Special Education Teachers, Preschool, Kindergarten, and Elementary School	223	270	52,250	Bachelor's degree
	Kindergarten Teachers, except Special Education	179	212	48,800	Bachelor's degree
	Training and Development Specialists	218	279	54,160	Bachelor's degree
Financial Sales and Management	Securities, Commodities, and Financial Services Sales Agents	312	360	70,190	Bachelor's degree
	Insurance Sales Agents	412	502	46,770	High school diploma or equivalent
	Loan Officers	289	330	56,490	High school diploma or equivalent

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TABLE 2

High-Growth/High-Wage Occupations Categories in the United States

IDC Category	U.S. Bureau of Labor Statistics Category	2010 U.S. Positions (000)	2020 U.S. Positions (000)	Median Salary ($)	Education Level
Financial, Business, Market Research Analysts	Management Analysts	719	876	78,160	Bachelor's degree
	Personal Financial Advisors	207	273	64,750	Bachelor's degree
	Market Research Analysts and Marketing Specialists	283	399	60,570	Bachelor's degree
	Financial Analysts	236	290	74,350	Bachelor's degree
Healthcare Management	Social and Community Service Managers	134	170	57,950	Bachelor's degree
	Medical and Health Services Managers	303	371	84,270	Bachelor's degree
Human Resources	Human Resources, Training, and Labor Relations Specialists, All Other	442	533	52,690	Bachelor's degree
IT Management	Computer and Information Systems Managers	308	364	115,780	Bachelor's degree
Lawyers and Paralegals	Lawyers	728	802	112,760	Doctoral or professional degree
	Paralegals and Legal Assistants	256	303	46,680	Associate's degree
Medical Professionals	Physicians and Surgeons	691	859	166,400	Doctoral or professional degree

TABLE 2

High-Growth/High-Wage Occupations Categories in the United States

IDC Category	U.S. Bureau of Labor Statistics Category	2010 U.S. Positions (000)	2020 U.S. Positions (000)	Median Salary ($)	Education Level
	Pharmacists	275	345	111,570	Doctoral or professional degree
	Clinical, Counseling, and School Psychologists	154	188	66,810	Doctoral or professional degree
	Dentists, General	131	158	141,040	Doctoral or professional degree
	Speech-Language Pathologists	123	152	66,920	Master's degree
Medical Support and Nursing	Radiologic Technologists and Technicians	220	281	54,340	Associate's degree
	Registered Nurses	2,737	3,449	64,690	Associate's degree
	Dental Hygienists	182	250	68,250	Associate's degree
	Respiratory Therapists	113	144	54,280	Associate's degree
	Physical Therapists	199	276	76,310	Doctoral or professional degree
	Occupational Therapists	109	145	72,320	Master's degree
	Healthcare Social Workers	153	204	47,230	Master's degree

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TABLE 2

High-Growth/High-Wage Occupations Categories in the United States

IDC Category	U.S. Bureau of Labor Statistics Category	2010 U.S. Positions (000)	2020 U.S. Positions (000)	Median Salary ($)	Education Level
Office Managers, Business Operations	Cost Estimators	185	253	57,860	Bachelor's degree
	Business Operations Specialists, All Other	1,064	1,187	62,450	High school diploma or equivalent
	First-Line Supervisors of Office and Administrative Support Workers	1,424	1,628	47,460	High school diploma or equivalent
Postsecondary Teachers	Postsecondary Teachers	1,756	2,062	62,050	Doctoral or professional degree
Sales and Marketing Professionals	Sales Representatives, Wholesale and Manufacturing, except Technical and Scientific Products	1,430	1,653	52,440	High school diploma or equivalent
	Sales Representatives, Services, All Other	561	667	50,620	High school diploma or equivalent
	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	400	466	73,710	Bachelor's degree
	Public Relations Specialists	258	316	52,090	Bachelor's degree
	Sales Managers	342	382	98,530	Bachelor's degree

TABLE 2

High-Growth/High-Wage Occupations Categories in the United States

IDC Category	U.S. Bureau of Labor Statistics Category	2010 U.S. Positions (000)	2020 U.S. Positions (000)	Median Salary ($)	Education Level
Trades: Electricians, Plumbers, Mechanics	Electricians	577	711	48,250	High school diploma or equivalent
	Plumbers, Pipefitters, and Steamfitters	420	528	46,660	High school diploma or equivalent
Trades: Supervisory	Construction and Building Inspectors	102	121	52,360	High school diploma or equivalent
	First-Line Supervisors of Construction Trades and Extraction Workers	559	690	58,680	High school diploma or equivalent
	Construction Managers	523	610	83,860	Associate's degree
	First-Line Supervisors of Mechanics, Installers, and Repairers	431	483	59,150	High school diploma or equivalent

Source: IDC, October 2013

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TABLE 3

Cross-Functional, CIP, and Microsoft Office–Related Skills

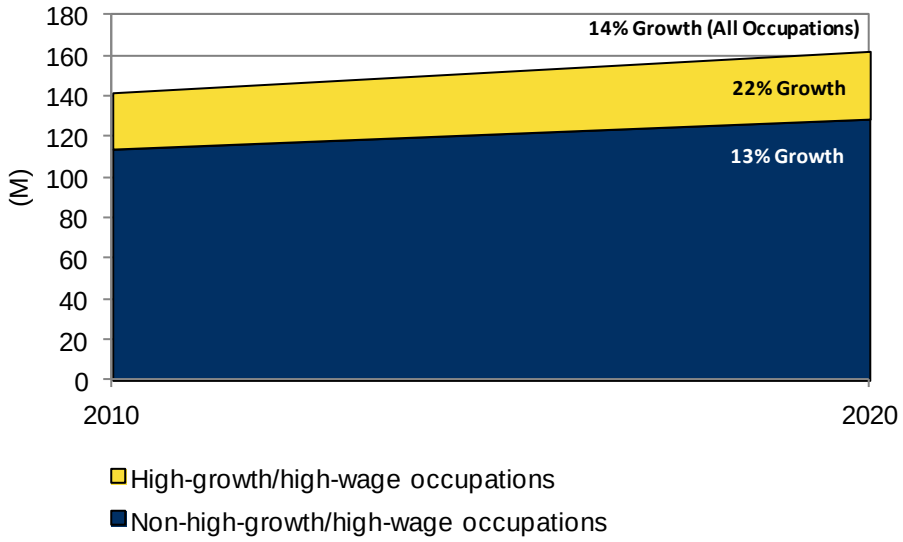
Cross-Functional Skills ("Soft" Skills)	CIP Skills	Microsoft Office–Related Skills
Oral and written communication skills	Oral and written communication skills	Oral and written communication skills
Microsoft Office	Microsoft Office	Analytical skills
Detail oriented	Detail oriented	Word processing
Problem solving	Problem solving	Financial reporting
Self-starting/self-motivated	Organizational skills	Financial analysis
Organizational skills	Microsoft PowerPoint	Financial planning
Work independently	Project management	Financial management
Microsoft PowerPoint	Analytical skills	Business analysis
Project management	Microsoft Word	Variance analysis
Troubleshooting	Bilingual/multilingual	Financial modeling
Customer service oriented	Strong interpersonal skills	Technical writing
Time management	Microsoft Excel	Business case development
Business development	Team oriented, teamwork	Spreadsheet software
Analytical skills	Quality assurance	Quantitative analysis/modeling
Microsoft Word	Word processing	Statistical software
Bilingual/multilingual	Data analysis	Presentation software
Strong interpersonal skills	Critical thinking	
Work ethics	Financial reporting	
Microsoft Excel	Data entry	
Team oriented, teamwork	Financial analysis	
Ability to travel	Financial planning	
Technical support	Financial management	
Entrepreneurial	Administrative skills	
Risk management	Business analysis	
Sales and operations planning	Highly organized	
Strong leadership	Microsoft Project	
Word processing	Variance analysis	
Integrity	Financial modeling	
Process improvement	Keyboarding	
Data analysis	Business analytics	
Quality control	Technical writing	
Critical thinking	Business case development	
Dependability	Spreadsheet software	
Adaptability	Quantitative analysis/modeling	
Data entry	Budget management	
Program management	Statistical software	
Conflict resolution/management		

Note: Skills are listed in order of frequency of requirement.

Source: IDC, October 2013

FIGURE 7

Growth in U.S. Employment



Source: U.S. Bureau of Labor Statistics and IDC, October 2013

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