White Paper

# Keys to the Future: Worldwide Readiness Skills to Ensure Student Success

Sponsored by: Microsoft

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## IDC OPINION

Educational leaders at the local, regional, and national level develop and administer educational curricula to best prepare our children and students for their future. Yet predicting exactly what skills will be needed for the jobs of tomorrow can be difficult. Educators must balance newer, nontraditional subjects such as emotional intelligence or the innovation process with more traditional skills such as reading, writing, and arithmetic. Educators should also balance the focus on job-specific skills with skills designed to develop well-rounded students and skills that can be broadly applied in the job market.

Compounding the educators' challenge, the number of skills required for the future jobs market is growing at an astonishing rate. IDC analyzed 76.7 million U.S. job postings to identify the positions expected to have the highest growth and wages during 2016–2024. We called these high-growth/high-wage positions "high opportunity" jobs. There are a large number of skills required of job candidates for those positions. In the U.S., our analysis found that there are 62 cross-category skills that were frequently required in the "high opportunity" jobs – a sharp increase from 37 "cross-category" skills we found in during similar research in 2013.

To understand the international situation, IDC chose six representative high opportunity jobs and examined the skill requirements for 5.4 million job openings in these positions across seven separate countries: the U.S., China, Germany, the UK, India, Australia, and Brazil. We found that there were 531 skills listed as requirements in these six job categories alone, far too many skills for any individual educational system to teach.

For educators, there is a path forward. Our analysis indicates that educators should focus on a broad set of cross-functional communication, integration, and presentation (CIP) skills such as oral and written communications skills, problem solving, and detail orientation. CIP skills represent 7 of the top 10 skills required in the six representative jobs across the seven countries studied. High school students require "job readiness" and not "job training," and an educational system that supports the development of these important and widely desired skills (including Microsoft Office skills, which came in at number 3 on the top skills list for representative occupations) will not only support the success of the students who aspire to high-opportunity positions but also lay the foundation for future success in the competitive global economy.

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## IN THIS WHITE PAPER

This IDC white paper presents research that forecasts the skills and competencies that will be most in demand around the world by 2024. Many of these are "soft" skills that are in demand in nearly all occupations, but these skills will be in particular demand in jobs that are forecast both to enjoy high growth and to be well above the median in salary potential.

This paper analyzes the job and skill requirements from 5.4 million job postings for six representative high opportunity jobs from the calendar year 2015 across seven separate countries: the U.S., China, Germany, the UK, India, Australia, and Brazil. The six jobs identified were Math and Science Teachers, Management Analysts, Computer and Information Systems Managers, First-Line Construction and Trade Supervisors, Nurse Practitioners, and Solar Photovoltaic installers. We chose these positions because they represent a wide variety of positions and because they could be considered representative of the types of positions that will grow annually through 2024.

Local, regional, and national educators can use this information to support specific and meaningful dialog about particular elements of a curriculum. Educators can be confident that these skills will be relevant in the future and also that the students who achieve these competencies will be highly sought-after contributors to the global economy for decades to come.

## SITUATION OVERVIEW

The debate over educational standards and the role of primary and secondary education in preparing students for the job requirements of the future continues to rage. According to the World Bank and UNESCO, well planned and adequately resourced secondary education can provide an environment where large numbers of adolescents can gain the skills and knowledge needed to better participate both economically and socially in a peaceful society, and develop the necessary knowledge to avoid risky behavior and lead a more healthy life. The Chinese have a proverb that illustrates the importance of education to the future of society: "If you are planning for a year, sow rice; if you are planning for a decade, plant trees; if you are planning for a lifetime, educate people."

**If you are planning for a year, sow rice; if you are planning for a decade, plant trees; if you are planning for a lifetime, educate people - Chinese Proverb**

With greater flexibility, local, regional, and national educators must determine the appropriate curricula and requirements to prepare students for the next phases of their lives. And with ongoing changes to the global employment landscape, educators must consider not only the needs of today's jobs but skills most likely to be in demand in the future.

### Requirements in a Changing Employment Landscape

In today's connected and competitive global economy, employers need job applicants with a broad range of capabilities. They need employees that can provide excellent service and support to customers and partners, work in fluid dynamic environments, and rapidly adapt to new technologies and skills in the workforce. With flatter organizational charts and more responsibility pushed to front-line employees, companies are looking for self-starting applicants who can work well both independently and in teams, with the initiative and creativity to perform problem solving and troubleshooting on an as-needed basis. IDC sees that a number of major trends will drive employer needs over the decade to come:

- **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 the 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.
- **Emergence of the green economy.** Global acceptance of the impact of climate change and the need to address it is having an effect on the jobs marketplace. This year's analysis revealed several green tech jobs in the high-opportunity job set, and the number of green jobs in this set will likely continue to grow in the years to come.
- **Millennialization of the workforce.** As Millennials represent an ever greater percentage of the global workforce, they are introducing a new dynamic into the workplace. Widely regarded as an "entitled generation," they are sometimes accused of having overly high expectations of themselves and low expectations of the amount of work and dedication required for their jobs. More commonly, these are "digital natives" who bring high expectations for intuitive technology and connectedness.
- **Consumerization of information technology (IT) and 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 facilitated by technology, these trends do not, for the most part, suggest a need to teach technology as an object of study. Instead, educators must anchor educational objectives in the real world and look at the underlying skills that provide the foundation for adapting to these trends. This analysis suggests educators should continue to focus on developing well-rounded students, capable of problem-solving and thinking on the fly and with the ability and curiosity to learn new skills in the future.

This approach will ensure that all stakeholders, including educators, policymakers, employers, and parents, can be assured that their students, children, and future employees will have the skills to become successful in the widest range of occupations.

## FUTURE OUTLOOK

### Tomorrow's Best Jobs

To identify the high-opportunity positions, IDC examined U.S. Bureau of Labor Statistics (BLS) employment data for 748 Standard Occupational Classifications (SOCs) – the U.S. equivalent of the International Standard Classification of Occupations (ISCO) – and selected the most attractive occupations according to three criteria:

- **Size.** To qualify, the occupation should have had at least 100,000 jobs in 2015.
- **Growth.** The occupation should grow by at least 100,000 jobs by 2024, or if it grows by fewer than 100,000 positions, then it must exhibit growth of 15% from its 2015 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.

This analysis identified 70 occupations that represent high-growth and high-wage positions, and these 70 occupations formed the basis for the U.S. analysis IDC performed as captured in the white paper "Keys to the Future: Align Workforce Readiness Skills to Ensure Student Success." To assess the situation internationally, IDC selected a subset of these occupations, chosen to represent a variety of positions. For the purposes of this paper, we will call these six the "representative occupations."

To analyze the skills required for these positions, IDC identified the best-fit job descriptions in each of six countries around the world: China, Germany, the UK, India, Australia, and Brazil. Because each country has its own job classifications taxonomy, IDC identified the best fit for the six positions in each country for analysis based on mapping provided by WANTED Analytics, a provider of real-time business intelligence for the talent marketplace. In cases in which an appropriate job category was not identified the job category for that country was excluded from the analysis. The number of listings used in this analysis by country and job category are provided in Table 1. For job description mapping see the appendix.

### TABLE 1

**Comparison of Position Postings in Representative Occupations in Seven Countries, 2015**

| Occupation | U.S. | Australia | Brazil | China | Germany | India | UK | Total |
|---|---|---|---|---|---|---|---|---|
| Mathematical Science Teachers, Postsecondary | 6,892 | 13,839 | 102,583 | 496,501 | 27,541 | 183,532 | 487,504 | 1,318,392 |
| Management Analysts | 641,062 | 47,751 | 345,272 | N/A | 48,064 | 440,399 | 479,671 | 2,002,219 |

## TABLE 1

### Comparison of Position Postings in Representative Occupations in Seven Countries, 2015

| Occupation | U.S. | Australia | Brazil | China | Germany | India | UK | Total |
|---|---|---|---|---|---|---|---|---|
| Computer and Information Systems Managers | 268,686 | 54,244 | 6,014 | N/A | 22,449 | N/A | N/A | 351,393 |
| First-Line Supervisors of Construction Trades and Extraction Workers | 386,785 | N/A | 136,749 | N/A | 112,052 | 19,671 | 110,114 | 765,371 |
| Nurse Practitioners | 123,914 | 68,245 | 29,980 | 149,142 | 31,746 | 1,234 | 506,558 | 910,819 |
| Solar Photovoltaic Installers | 9,534 | 8,142 | 77,324 | 359 | 1,386 | N/A | N/A | 96,745 |
| Total | 1,436,873 | 192,221 | 697,922 | 646,002 | 243,238 | 644,836 | 1,583,847 | 5,444,939 |

Source: WANTED Analytics, May 2016

## Skills Requirements for Today and Tomorrow

To be ready for tomorrow's high-opportunity positions, educators today must understand the skills that will be required for those jobs. To determine those skills, IDC examined 5.4 million job postings between January 1, 2015, and January 1, 2016, to job boards and staffing companies' corporate Web sites, supplied by WANTED Analytics, a provider of real-time business intelligence for the talent marketplace.

Our analysis revealed more than 500 distinct skills are required by employers across these six occupations. The top skills required across the six representative occupations are shown in Figure 1.

The most required skills across the representative occupations include oral and written communication skills, project management, teamwork, marketing, and creativity. The leading 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 is number 9.

This set of 20 skills represents the most commonly required skills in demand across the world today. This set is more important than any specific technology skill, deep science or math, or even most business skills. This set represents skills that are both important and widely required across positions. And the vast majority of them are "soft" skills that are applicable across a wide variety of occupations.

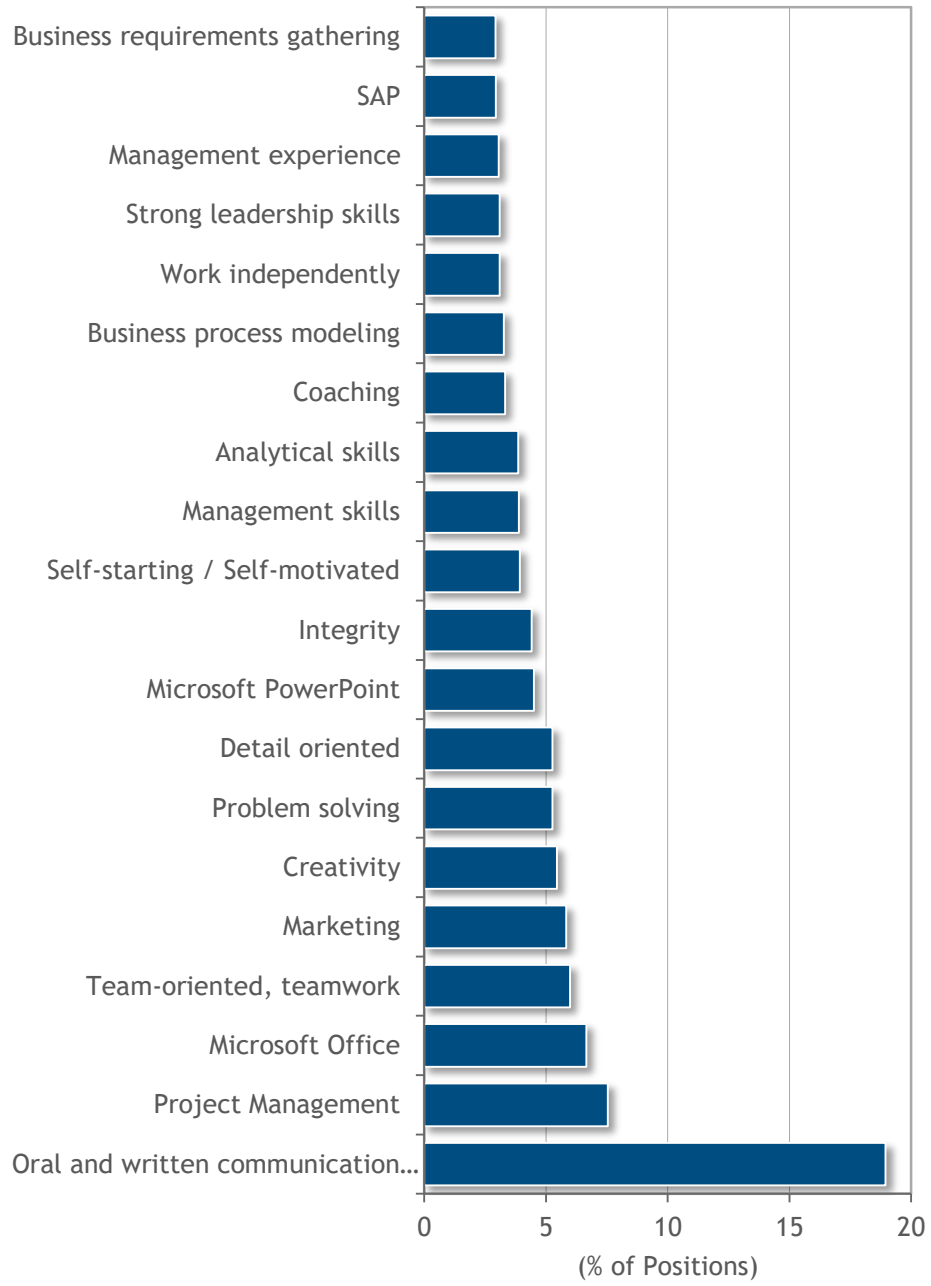
Many of these skills are included in most contemporary curricula. In fact, teamwork, creativity, problem solving, detail orientation, and integrity are relevant across all knowledge and domains.

"If we take seriously the notion that learning is a consequence of thinking, then thinking — in all its forms: critical, creative, and reflective — needs to be a part of every lesson we teach," says Ron Ritchhart, director of the Cultures of Thinking project at Harvard's Project Zero.

Science, Technology, Engineering, and Mathematics (STEM) education has emerged as one of the most sought after curriculum designs for integrating science, technology, engineering, and mathematics into K–12 education. Initially intended to reduce performance gaps and increase employment prospects between student populations, it has become a platform for improving academic performance across disciplines. In fact, many STEM learning activities, especially those that emphasize project based learning, are designed to focus on student engagement, knowledge acquisition, literacy analysis, synthesis, and critical thinking skills that will impact the depth of student learning — precisely those skills that are the most in demand for future positions.

## FIGURE 1

### Top Skills for Representative Occupations in Seven Countries



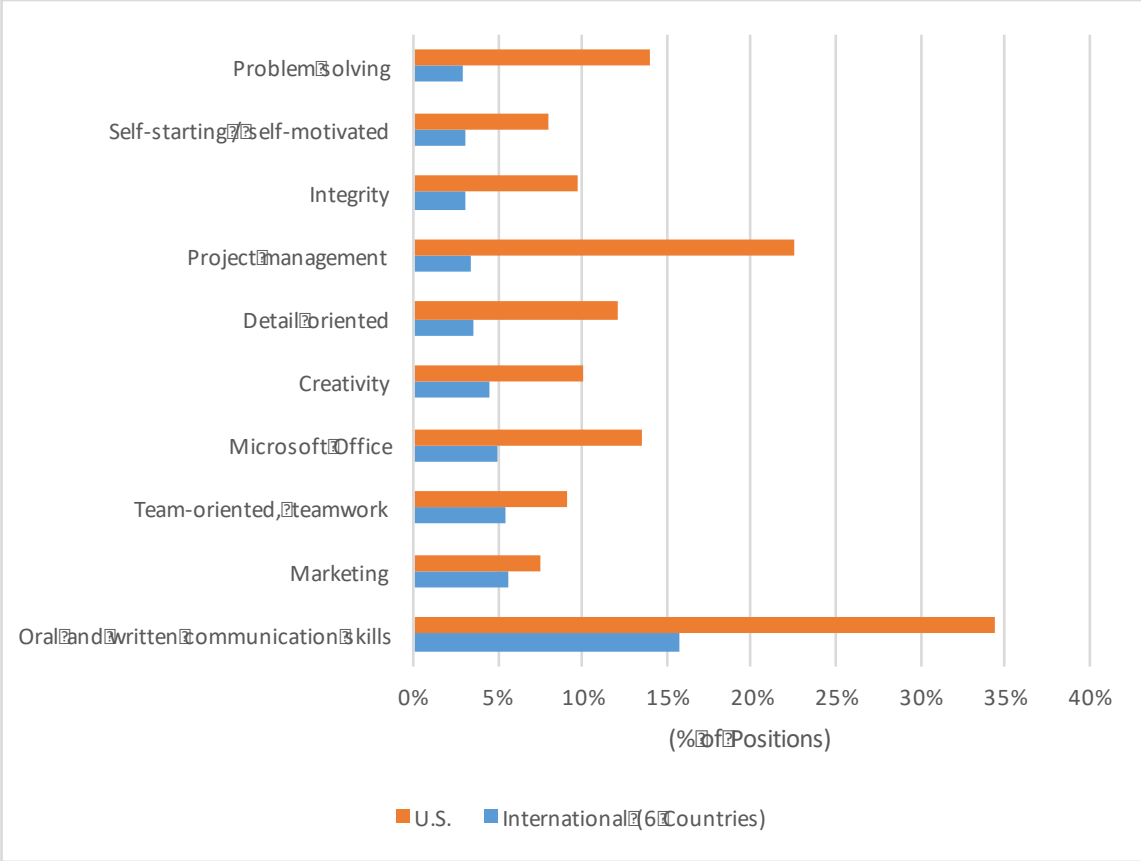

Source: IDC, based on WANTED Analytics and U.S. Bureau of Labor Statistics data, May 2016

## *Comparing Skills for Representative Jobs in the U.S. and Internationally*

IDC compared the top skills required for each of the representative positions the other six countries in the analysis and in the U.S. (see Figure 2). There is a large amount of overlap between the skills, with seven of the top 10 skills in common. The most notable difference is the international sample of skills is more diverse. In the U.S. the top skills are common in an even greater number of listings than for the entire international sample.

## FIGURE 2

### Comparison of Top 10 Skills for Representative Positions Internationally and in the U.S.




* Indicates communication, integration, or presentation skill

Source: IDC, based on WANTED Analytics and U.S. Bureau of Labor Statistics data, May 2016

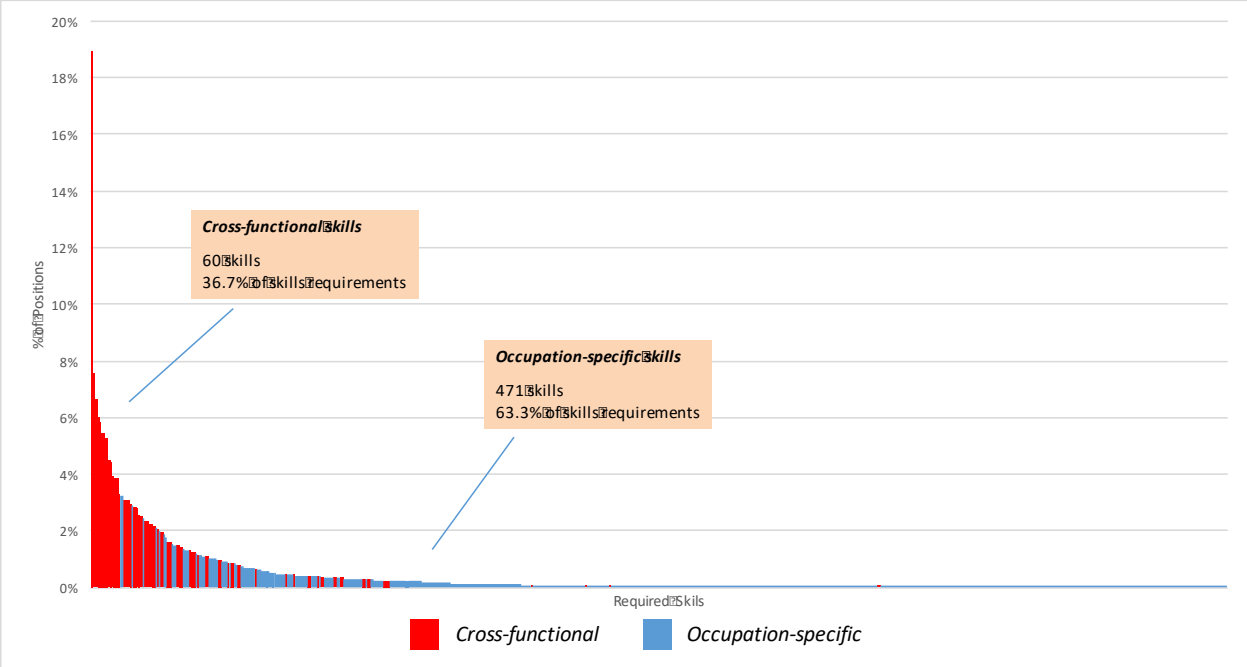
## *Most Common Skills Are Cross-Functional; Occupation-Specific Skills Are Lower Incidence*

Most of the top skills are required by each of the six representative positions 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, nursing and healthcare skills, and energy or construction management are much less frequently required. IDC analysis shows that 12% of skills in the six representative positions are cross-functional in nature and represent 36% of the skills listed for those job postings. The remaining 88%, or 471 skills, are occupation-specific skills (see Figure 3). For tomorrow's workforce, cross-functional skills represent the fundamental tools for success in high-paying, high-growth jobs.

## FIGURE 3

### Frequency of Skills Mentions: Comparison of Cross-Functional Skills and Occupation-Specific Skills for Six Representative Positions in Seven Countries




Source: IDC, based on WANTED Analytics data, May 2016

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, suggesting that they should receive less emphasis in general high school curricula.

It is instructive to think about these skills in three big buckets that overlap somewhat:

- Communication, integration, and presentation skills
- Entrepreneurialism and related skills
- Microsoft, Microsoft Office, and other software skills

Each of these sets is easy to understand, and they are mutually reinforcing.

## Communication, Integration, and Presentation Skills

Of particular interest is a subset known 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 24.7% of job postings in the six representative occupations and make up 7 of the top 10 skills required for these occupations. 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.

## Entrepreneurialism and Related Skills

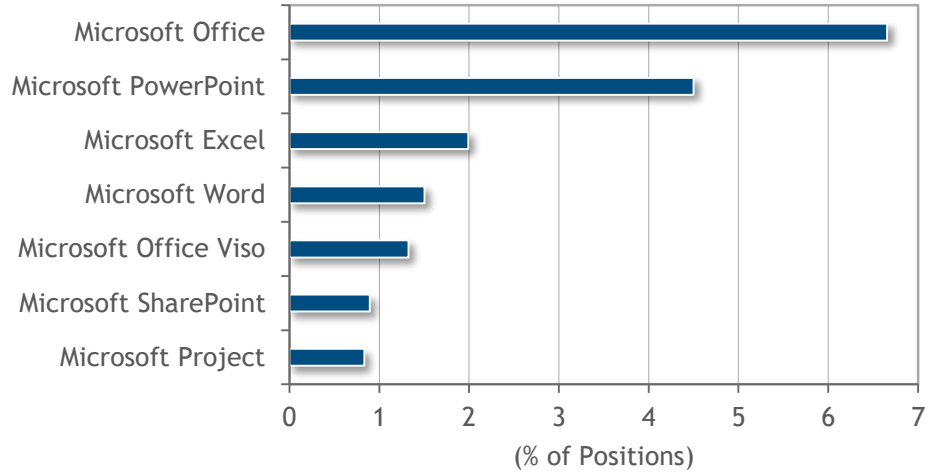
Competitiveness and entrepreneurial skills help prepare students for the changing workplace and even help students create those changes in the workplace and in society. This category includes self-starting/self-motivated, which is the number 11 most frequently required skill for the six representative occupations. "Entrepreneurial" – meaning enterprising or willing to take risks for profit or gain – was number 49 on the list of job skills for these occupations.

## 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 6.7% of the six representative positions (see Figure 4). Further, components of Microsoft Office were also specifically called out including Microsoft PowerPoint (4.5% of positions), Microsoft Excel (2.0% of positions), and Microsoft Word (1.5% of positions). For comparison, the most frequently required non-Microsoft software was required in 2.9% of positions. And Microsoft software comprised 7 of the top 10 explicitly mentioned software skill requirements across the six representative positions.

## FIGURE 4

**Microsoft Software Skills Requirement Frequency for the Six Representative Occupations in Seven Countries**




Source: IDC, based on WANTED Analytics data, May 2016

### *Individual Skills Requirements for Representative Occupations*

The requirements for cross-category CIP skills, entrepreneurial skills, and Microsoft Office skills span a broad range of representative occupations. IDC analyzed the skills required for each representative occupation across the seven countries included in this analysis (see Figure 6). While a number of skills are specific to individual positions, such as carpentry for construction and trade supervisors and business process modeling for business analysts, cross-category soft skills make up well over half of the top 10 skills requirements for each of these six positions. Similarly, CIP skills including oral and written communication skills are in the top 2 for each position, and Microsoft Office or one of its components (e.g., Microsoft PowerPoint, Microsoft Word, Microsoft Excel) is also among the top 10 skills required for each position except for computer and IS managers. [Management experience does seem like "cross functional", but for this draft, we will be consistent, and adjust during the next revision.]

## FIGURE 5

### Skills Requirements for Select High-Opportunity Occupations in the United States

Management Analysts

| Rank | Skill | % of Positions |
|---|---|---|
| 1 | Oral and written communication skills | 24.2% |
| 2 | Project Management | 13.1% |
| 3 | Microsoft Office | 9.6% |
| 4 | Problem solving | 9.0% |
| 5 | Microsoft PowerPoint | 8.8% |
| 6 | Detail oriented | 8.6% |
| 7 | Analytical skills | 8.0% |
| 8 | Marketing | 8.0% |
| 9 | Business process modeling | 7.1% |
| 10 | Creativity | 6.2% |

Postsecondary Mathematical Science Teachers

| Rank | Skill | % of Positions |
|---|---|---|
| 1 | Oral and written communication skills | 14.6% |
| 2 | Team-oriented, teamwork | 6.9% |
| 3 | Creativity | 6.8% |
| 4 | Marketing | 5.8% |
| 5 | Microsoft Office | 5.4% |
| 6 | Management skills | 2.9% |
| 7 | Integrity | 2.8% |
| 8 | Detail oriented | 2.1% |
| 9 | Self-starting / Self-motivated | 2.0% |
| 10 | Sales experience / ability | 1.9% |

Computer and IS Managers

| Rank | Skill | % of Positions |
|---|---|---|
| 1 | Project Management | 31.8% |
| 2 | Oral and written communication skills | 31.5% |
| 3 | Management experience | 13.0% |
| 4 | Strong leadership skills | 12.8% |
| 5 | Problem solving | 11.4% |
| 6 | Coaching | 10.4% |
| 7 | Management skills | 10.3% |
| 8 | Creativity | 10.3% |
| 9 | Change Management | 9.6% |
| 10 | Risk Management | 9.4% |

Supervisors: Construction Trades & Extraction Workers

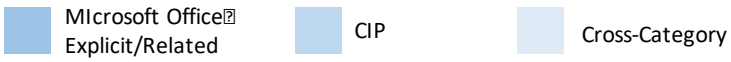
| Rank | Skill | % of Positions |
|---|---|---|
| 1 | Oral and written communication skills | 11.0% |
| 2 | Carpentry | 6.1% |
| 3 | Team-oriented, teamwork | 5.4% |
| 4 | Microsoft Office | 4.9% |
| 5 | Detail oriented | 4.4% |
| 6 | Self-starting / Self-motivated | 3.9% |
| 7 | Construction management | 3.7% |
| 8 | Quality control | 3.6% |
| 9 | Sales and operations planning | 2.8% |
| 10 | Integrity | 2.8% |

Nurse Practitioners

| Rank | Skill | % of Positions |
|---|---|---|
| 1 | Oral and written communication skills | 16.9% |
| 2 | Team-oriented, teamwork | 4.9% |
| 3 | Marketing | 3.8% |
| 4 | Integrity | 3.2% |
| 5 | Creativity | 3.1% |
| 6 | Strong leadership skills | 3.1% |
| 7 | Microsoft Office | 3.0% |
| 8 | Detail oriented | 2.8% |
| 9 | Self-starting / Self-motivated | 2.8% |
| 10 | Highly motivated | 2.7% |

Solar Photovoltaic Installers

| Rank | Skill | % of Positions |
|---|---|---|
| 1 | Oral and written communication skills | 9.2% |
| 2 | Preventive maintenance | 8.1% |
| 3 | Customer service oriented | 3.9% |
| 4 | Electrical systems | 3.8% |
| 5 | Detail oriented | 3.6% |
| 6 | Marketing | 3.5% |
| 7 | Microsoft Office | 3.5% |
| 8 | Integrity | 3.1% |
| 9 | Team-oriented, teamwork | 2.9% |
| 10 | Basic computer skills | 2.8% |




Source: IDC, based on WANTED Analytics data, May 2016

## CONCLUSION

The global economy is dynamic, and many of the skills required for positions in the future will pertain to technologies and work practices yet to be developed. The number of skills required to be successful in the jobs forecast to be most in demand in the future is growing and will likely continue to expand as employers increase expectations for new hires and entrust front-line employees with greater levels of responsibility.

Employers look for new employees that are adaptable and think critically. Employers need workers who:

- Are equipped to serve, work, and communicate with a diverse base of customers and coworkers
- Are self-motivated, self-directed, and able to adjust to the changing relationship with employers and a less paternalistic work culture
- Can deal with ambiguity and take initiative to function effectively in increasingly complex business structures and organizations
- Work effectively both independently and in teams, often with limited or infrequent guidance
- Are well-versed in digital, mobile, and social technologies
- Can think beyond the specific task or job to the systemic implications of an action, inaction, or failure

These trends suggest that educators should prepare their students with a set of common, core skills that students will leverage to be successful for the rest of their working lives. Many of the most important and common skills are evident and even common today. These include the broad CIP skills including oral and written communication, problem solving, detail orientation, and project management. Included in these CIP skills is familiarity with Microsoft Office and Microsoft PowerPoint, which provides the foundation for communication and critical thinking required in tomorrow's marketplace.

### Through 2024: Implications for Educators, Employers, and Tomorrow's Job Seekers

#### *"Anchor Standards in the Real World"*

IDC analysis suggests that a relatively small, albeit growing, set of cross-functional skills are those most in demand for current and future occupations and that those skills focus more on job readiness than on job training per se. Not only are they necessary to create well-rounded students and employees, but they are also the most specific and important skills common across the high-opportunity positions in this study.

#### *For Educators*

Educators cannot teach job-specific skills for all positions or even most of the high-opportunity positions of the future. With over 1,000 job-specific skills required to be successful in high-opportunity positions, preparing students with job-specific skills cannot be a reasonable objective in a general education classroom. Data science, welding, SQL, electronic medical records, and carpentry are best left to vocational and post-secondary programs or to on-the-job training.

But with the number of cross-category skills also numbering in the dozens, it is challenging for educators to take on this entire list of valuable skills. Instead, educators should focus on foundational CIP skills including oral and written communication skills, problem solving, detail orientation, analytical skills, team orientation, and organizational skills. These skills not only are among the top 20 skills necessary for success in high-opportunity positions but will also continue to be relevant well beyond 2024.

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 enable students and future employees 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 an 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 and 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 many of these skills benefit from knowledge of personal productivity applications, there are few broad-based requirements for heavily technical skills in either high-opportunity positions or occupations overall.

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 proficiency with the tools that support communication, integration, and presentation skills. And 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.

Establishing appropriate assessments is essential to ensure a truly career-ready education outcome. Education policymakers should link real-world objectives and high-quality assessments to curricular materials in a way that does not undermine the instructional process or the intentions of the standards. This is particularly important as responsibility for assessments is transferred to the states with the new Every Student Succeeds Act. An assessment program should 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.)
- Performance-based, real-world tasks to extend beyond the recitation of facts and instead demonstrate the ability to apply standards in practice to demonstrate CIP capabilities

- Sufficient analysis and diagnostic capacity to provide student and teacher feedback on areas of improvement and approaches or techniques likely to result in improved performance
- Appropriate technologies not only to facilitate consistent administration and evaluation of assessments but also to be used as a platform for demonstrating core practices

### *For Employers*

Ensuring employee readiness for any given occupation is an ongoing challenge. New hires will often have only a small set of specific skills required to be successful in an occupation. Job training and ongoing career development is also the responsibility of managers and companies. Training performed after a candidate is hired can augment and refine the employee's skills and provide the specific skills required for that particular position.

It is unrealistic to expect schools to prepare students for any given specific job or even a specific industry. To do so would require schools to prepare students for more than 835 occupations and more than 12,000 skills that might be outdated by the time the students enter the workforce. For effectiveness and efficiency, employers and vocational schools 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 high-opportunity jobs require little more than a high school degree, including trades such as electrician, plumber, construction supervisor, and millwright. But it is notable that the largest categories in the high-opportunity occupations list — those expected to represent the largest number of jobs in 2024 — are higher-skilled positions in the medical, professional, 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.

### *For Everyone*

Calls to introduce new technologies into the classroom are common, but examples abound of school districts investing in the latest, hottest technology only to find limited ability to integrate it into a meaningful curriculum. Stakeholders must resist the urge to call for technology for technology's sake in the classroom and instead focus on technologies that contribute to the CIP skills.

While it is beyond the scope of this research to suggest specific technologies to include or the best way to incorporate them into curricula, it is essential to align instructional content, in-class expectations, assessments, and educational tools to prepare students and assure stakeholders that the skills students learn in school will be relevant and valuable for the future.

## LEARN MORE

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## Appendix: Skills Definitions

Table 2 lists the skills IDC considers cross-functional skills, CIP skills, and Microsoft Office–related skills.

## TABLE 2

### 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 | |

## TABLE 2

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

| Cross-Functional Skills ("Soft" Skills) | CIP Skills | Microsoft Office-Related 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 | |
| Management skills/experience | | |
| Conflict resolution/management | | |

Source: IDC, May 2016

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