WHITE PAPER

Professional Pathway Readiness for Today's Students

Preparing our nation's learners for the changing workplace

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About the Authors

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Jane is dedicated to building smart business-education partnerships that give all kids a chance to graduate prepared and inspired to thrive in life and careers. After shaping the collaboration between Washington Metropolitan Area employers and the Montgomery County Public Schools, she founded the 114th Partnership in 2011 to improve business-education partnerships nationwide.

Jane's approach has been featured in numerous publications, including a 2009 Harvard Business School case study and *Leading for Equity,* published by Harvard Education Press. Her work was highlighted in the University of Phoenix report "Investment Criteria for STEM Education: What Counts for Excellence in STEM Programs," and she is the co-author of a 2011 Aspen Institute paper, "Why One Size Does Not Fit All: Strategic Spending and Collaboration for College and Career Readiness."

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Clare is an experienced researcher and evaluator in the areas of science and mathematics instruction. She has served as the Supervisor of Applied Research in the Montgomery County Public Schools; Associate Professor at the University of Maryland, College Park in the Department of Educational Measurement, Statistics, and Evaluation; and as the Director for Science Education Programs at The National Institute of Mental Health.

Clare is the author of numerous articles in publications such as *The Journal of Educational Research, The Journal of Research in Science Teaching,* and *The Journal of Educational Psychology.* She is the recipient of awards from The American Educational Research Association, The National Center for Education Statistics, and The International Testing and Evaluation Association, and she is an experienced presenter on issues related to STEM (science, technology, engineering, and math) education and college readiness.

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"By 2020, two thirds of all U.S. jobs will require at least some postsecondary education."

Readiness for Professional Pathways

The postsecondary aspirations of high school graduates are higher now than at any time in our nation's history. Since 1960, the number of graduates who enter college immediately after high school has grown from about 45 percent to about 66 percent.[1] Most graduates who enter the workforce immediately after high school also are pursuing postsecondary education in order to obtain and keep the best-paying jobs.[2] The skills needed to enter the workforce mirror those needed for college coursework.[3,4] But almost one half of high school graduates report that they are unprepared for college and the workplace.[5,6,7]

This white paper discusses the importance of professional pathway readiness and identifies instructional experiences that prepare students to meet the challenges they will encounter on the pathways that lead to college, work, or a combination of both. It also describes how case study resources developed by the 114th Partnership foster professional pathway readiness.

The Impact on Employability

The gap between the employability of high school graduates who are prepared for professional pathways and those who are not is growing.[8] This change is due in part to a shift in the distribution of jobs in the job market. Technology has led to a sharp decline in the demand for middle-wage jobs that require routine procedural skills.[9] Many of the middle skills and manual jobs that allowed individuals with a high school diploma to earn a good living in the past have now been automated or computerized.[10] By 2020, two thirds of all U.S. jobs will require at least some postsecondary education.[11]

Moving Toward "Professional Pathway Readiness"

Professional pathway readiness goes beyond traditional definitions of college and career readiness, recognizing the dynamic nature of tomorrow's workplace in which many students will switch careers often and work in jobs that do not yet exist.

Throughout their professional lives in an ever-changing global economy, today's students must be able to connect their personal passions to viable career pathways while constantly developing their skills via traditional and emerging post-secondary education options.

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The Impact on Income

Students' preparedness for professional pathways has long-term consequences for their lifetime earning power and job satisfaction.[12,13,14,15] The demand for highly educated workers, particularly those with a college degree, has increased.[16] On average, each additional year of education raises annual income by 10 to 15 percent.[17,18,19]

In addition, higher educational achievement is associated with more rapid wage increases. Between 1995 and 2005, the inflation-adjusted earnings of workers with four years of postsecondary education rose 12.5 percent, while the earnings for those with only a high school diploma rose 5.8 percent.[20] Even among workers with similar incomes, workers with higher educational attainment have more rewarding jobs and greater prestige.[21,22]

The Importance of Deep Understanding

The quality of students' high school experiences has a significant influence on their readiness for professional pathways.[23,24,25,26] High-quality experiences in 21st century classrooms help students develop deep understanding of their coursework and apply what they are learning to real-world situations. Many students who are unprepared for college and the workplace participated in high school experiences designed for the 20th century.

Most classroom instruction still relies heavily on textbooks and lectures that focus on breadth over depth.[27] These instructional methods are efficient when teachers need to cover a large amount of content in a short period of time. The drawbacks are that they present information as self-evident and suggest that learning is about "knowing the right answers".[28] Although these methods help students acquire content knowledge, they do not help learners connect the content in one course with another or provide opportunities for students to apply what they learn in school to the outside world. As a result, students acquire knowledge that is "a mile wide" and understanding that is "an inch deep."

To develop the foundation of professional pathway readiness, students need to connect knowledge with an understanding of how that knowledge was developed. Inquiry-based instruction allows students to go "a mile deep" in their knowledge acquisition to solve problems that are "an inch wide." It helps them understand how information becomes knowledge and use what they learn in one course to deepen their understanding in another.[29] Inquiry-based instruction also helps students develop the critical thinking skills and work habits needed to manage the unexpected problems and changing circumstances they will encounter along their professional pathways.

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Using Case Studies to Connect the Classroom with the Workplace

The instructional strategies that are most effective in deepening student understanding use inquiry-based instruction to connect course content with real-world applications. This connection helps students appreciate the relevance of what they are learning. When students understand why they need to know something, they become more engaged in their coursework and more likely to develop the skills and work habits that prepare them for professional pathways.

Case studies have been used in higher education for more than 150 years to promote deep understanding of course content and prepare students for the real world of careers.[30] Although the use of case studies has now expanded beyond higher education to include audiences as diverse as high school students and business leaders, the underlying inquiry-based case study framework has remained the same.

Effective case studies use concise, engaging stories to connect course content with real-world situations or problems. The case-study process requires team interaction, research into alternative points of view, analysis, critical thinking, and discussion of decisions or recommendations.[31] Case studies do not give students one right answer. In contrast, they require students to think critically about the best solution.

The emphasis on critical thinking makes student-centered, case-based instruction more effective than teacher-centered instruction that relies heavily on textbooks and lectures.[32,33,34] Case studies help students learn to view issues from multiple perspectives and apply the skills they develop in one case to solve problems in another.[35] Students report that case studies are more engaging than teacher-centered instructional methods, and that the inquiry-based activities make course content easier to remember.[36]

The instructional benefits of case studies can be offset by the amount of time needed to prepare and conduct them. Time limitations are especially problematic for teachers who must prepare students for more advanced courses, or standardized tests, or both.[37] The amount of time required to plan and implement high-quality inquiry-based instruction can be burdensome even for very experienced teachers.[38] From a teacher's perspective, the best case studies include materials that streamline instructional planning and align with course objectives.[39]

"When students have the opportunity to interact with practicing professionals, they become aware of careers and career requirements that might be unknown to them or their teachers."

Linking Classroom Instruction with Professional Pathways

As students develop a deeper understanding of their coursework, they also need to explore and plan for postsecondary career options that are very different from those of a few decades ago. Advances in technology, transportation, and communication have changed and expanded the professional pathways available to high school graduates.

Most people aspire to occupations that interest them and that they think they will be good at.[40,41,42] Many students are unaware of the college majors and professional pathways that lead to today's high-demand work opportunities.[43,44] Others are unaware of the educational requirements needed to prepare for careers that interest them[45] or the connections between what they learn in their courses and the work of professionals.

Case studies give employers an opportunity to significantly improve students' awareness of professional pathway options and requirements.[46] When students have the opportunity to interact with practicing professionals, they become aware of careers and career requirements that might be unknown to them or their teachers. They also learn how potential professional pathways align with their interests, abilities, and goals. Practicing professionals who made nontraditional career choices also can serve as role models to help expand students' perceptions about the range of rewarding career possibilities available to them.

114th Partnership® Case Study Resources

The 114th Partnership fosters relationships between business and education professionals to help build students' professional pathway readiness. Two 114th Partnership programs, Spark 101 Interactive STEM Videos and Pathway Ready Professional Challenges, use real-world case studies to introduce students to genuine workplace challenges and the skills needed to address those challenges. Both programs are supported by employers and free to schools.

Since 2013, the 114th Partnership has provided case study programs to more than 2,000 educators and one million students. Although the effect of any given instructional experience is small, case-study experiences can have a significant cumulative effect on students' professional pathway choices.[47,48,49] The 114th Partnership case studies have helped students better understand the connections between school and work and identify careers that interest them.

"The videos encourage students to think critically about real-world STEM problems, develop alternative approaches, and refine their solutions as new information is collected."

Spark 101 Interactive STEM Videos

These teacher-facilitated videos use an interrupted case-study format that gives students the opportunity to model the behavior of professionals in STEM (science, technology, engineering, and math) fields. The videos encourage students to think critically about real-world STEM problems, develop alternative approaches, and refine their solutions as new information is collected. Teachers like the interrupted format because students understand that STEM problems have no "right answer" and that STEM knowledge is revised as new data become available.[50]

The educators who designed the Spark 101 Interactive STEM Videos did so with teachers in mind. The content of every case study is aligned with curriculum standards, so that the case studies integrate with the existing curriculum. The case studies can be completed in one or two class periods, giving teachers time to move on to other topics as needed. They include sample lesson plans and companion resources to streamline instructional planning and delivery, help teachers prepare students, and facilitate student inquiry.

The case studies begin with an industry professional introducing students to a real-world STEM problem taken from his or her organization. Teachers then pause the video to give student groups time to come up with tentative solutions. Students work on solutions for about 15 minutes before watching the next video segment. The industry professional provides additional information, explains how his or her organization arrived at its solution, and asks students to consider how their process and recommendations compare. The final segment provides information about the careers profiled, the educational requirements, and personal advice from the industry professional about how to proceed.

“The challenges make coursework more relevant and increase student awareness and interests across a range of careers.”

Pathway Ready® Professional Challenges

Pathway Ready Professional Challenges address a wide range of STEM and other professional areas. They are facilitated by employee volunteers, face-to-face in schools or in the employer’s offices. The employer selects a real-world challenge drawn from experience and asks teams of students to develop and present a solution. The volunteers then provide coaching to help students refine their ideas. They evaluate the students’ presentations and provide feedback according to accepted industry criteria such as credibility and presentation quality.

Employers can develop challenges that last one hour, four hours, or 20+ hours. The longer the challenge, the more one-on-one coaching is available to students. The volunteers show students how the knowledge and skills they acquire in high school can help them find solutions to the problems faced by industry professionals. The challenges make coursework more relevant and increase student awareness and interests across a range of careers.

"Students who participate in 114th Partnership case study programs are more engaged in learning and more motivated to acquire the knowledge and skills they need to access professional pathways."

Summary

Over the next five years, more than 20 million students will graduate from our nation's high schools.[51] In order to successfully transition to college and the workplace, they must be prepared to meet the challenges they will encounter along their professional pathways.

High school instructional experiences that foster deep understanding of course content can help them identify their interests and begin to develop the skills that will be critical to success over the course of their professional lives. But skill development is not enough. Students also need to be aware of the range and characteristics of the career options that are the destinations of their professional pathways. Case studies help to meet the needs of our nation's emerging professionals.

The 114th Partnership gives students opportunities to apply what they are learning in school to solve workplace problems and connects them with industry professionals in high-demand careers. Whether the experience is delivered by employers or by teachers, students benefit when given a chance to put their academic skills into practice.

Students who participate in 114th Partnership programs report they are more aware of what industry professionals do, better understand how they can apply the skills they learn in school to the workplace, and want to find out more about the careers profiled.

Education professionals and employers report that students who participate in 114th Partnership case study programs—Spark 101 Interactive STEM Videos and Pathway Ready Professional Challenges—are more engaged in learning and more motivated to acquire the knowledge and skills they need to access professional pathways and prepare for success in the global economy.

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The 114th Partnership®

Named for the meridian that bridges the Great Continental Divide, the 114th Partnership is a national nonprofit that facilitates productive partnerships between educators and employers.

Our collaborations support ongoing relationships and measurable outcomes. Since 2013, we have reached approximately 2,000 educators and 500,000 students.

By connecting classwork to professional pathways, we will help one million students graduate college- and career-ready by 2020.

For more information on how you can help improve students' professional pathway readiness, please email professionalpathways@114th.org.
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