
Foreword: Powerful Ideas in Applying Learning Sciences, Cognitive Sciences, and Neuroscience to Workforce Development

Applying Learning Sciences Research to Learning and Workforce Development for Next Level Learning Brief Series

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Introduction

Alice has all the things we talk about people needing to thrive in the workforce – self-efficacy, growth mindset, grit – in abundance. For example, she believes in her abilities and that she can improve through effort. She also shows perseverance towards achieving long-term goals even when they are not easy.

In February of 2018, Alice was catching the subway home from her job as an assistant manager of a high street clothing store, when she saw an advertisement for a workforce development program in healthcare management and administration. The ad read that the program was primarily designed for low-income women of color, like Alice, and focused on reskilling them to organize things in a health care setting, such as patient appointments and records. It promised that this brand-new offering would teach one of the most in-demand skills in New York City and cited the 2017 and 2018 LinkedIn Workforce Reports, which listed Healthcare Management as the second-most desired skill in the city¹.

Alice decided to leave her job in retail and enroll in the intensive health care management program from the advertisement. The program took about a year to complete, and Alice financially supported herself through it by working as a retail store associate on the weekends and some evenings.

Alice's program was very tightly focused on only teaching her the particular job skills needed in healthcare management. For example, it had several intensive modules about the exact application sequences required to manage health records in Electronic Health Record Systems records such as EPIC or Allscripts. It involved being assessed on the acronyms often found in health care records and following phone scripts to answer patient calls. As the program was so intensively focused on teaching this content, it was not designed to explicitly teach soft skills or interpersonal skills. Nor did it implicitly support the development of Alice's ability to apply the content beyond the specific exercises taught.

In 2019, Alice graduated from the program and received outstanding feedback. Also, in 2019 the same LinkedIn Workforce Report that had said Healthcare Management was the number two most in-demand skill in the city in 2017 and 2018 now said that it was the number five most in surplus skill in the city². From starting to graduating from her program, Alice went from pursuing an in-demand skill to one that was in oversupply.

Despite having invested hugely in skills development, completing a comprehensive workforce training program, and attaining a certification, Alice was now financially worse off than she was a year earlier. At the start of the pandemic, over a year after she had graduated, she had just got her first job in health care handing out masks at an emergency facility. Nearly every time someone hears this story about Alice, they give the same reactions. Either – "oh, I am so sorry to hear about Alice's experience, but it isn't common," or "goodness, it must not be a particularly good workforce development nonprofit." However, sadly the data tells us otherwise.

Firstly, according to a job retraining analysis conducted in Wisconsin, laid-off workers who enrolled in 'in-demand' community college programs were 17% less likely to find steady work and earned 60 cents on the dollar compared to those that did not retrain³. Furthermore, many of the jobs these same workers reskilled into are at substantial risk of automation in the next five years. These and similar findings have also been observed while studying the efficacy of coding boot camps.

Secondly, in a recent workforce development landscape analysis run by the Harvard Project on Workforce, only 8% of workforce development organizations emphasized both job-specific skills and transferable skills. Only 9% were considered to be adequately preparing learners for the future of work. Less than a third engaged with employer organizations⁴. Another study conducted by Accenture Corporate Citizenship found that less than 1% of workforce development organizations strived to develop their learners' adaptability⁵.

Our sector, including workforce development organizations, community college, nonprofits, coding boot camps, and more, makes decisions about what programs are offered based on the latest economic trends. Reports like the LinkedIn Economic Graphs Workforce Report, which leverages LinkedIn's incredible data, is powerful at highlighting insights into what skills have an oversupply and what skills are in demand in particular cities at any given moment. Yet, by the time many learners, like Alice, enroll, attend, and graduate these programs, those specific, very specialized skills are often redundant.

This is not to say that we should not try and use the best labor-economics data available to inform our decision-making about programming, design, and funding. We absolutely should. But it cannot be the only or even the primary lens, especially given that stories like Alice's are becoming increasingly common as society is disrupted due to automation, climate change, globalization, and – of course – public health crises. We need to add a human-centered education and learning lens to our labor-economic one so that we can create durable learning experiences that explicitly and implicitly set people up to thrive beyond one job context.

It is easy to get swept away by big data. We share Alice's story because, when we at the Next Level Lab at the Harvard Graduate School of Education inquire into the workforce development context, we do so with a deep appreciation for the individual. Since coming together with the support of Accenture Corporate Citizenship, our lab has drawn upon our knowledge, research, and insights to consider what it means to have a learning science, cognitive science, neuroscience, and social science informed workforce development practice that enables learners to thrive in a dynamic and uncertain future.

Our lab comprises individuals with former roles including teachers, community college educators, advisors to workforce focused high school programs, coding bootcamp founders, and training managers from fortune 50 companies. Together and through the deep expertise of Cognitive Science Professor Tina Grotzer and Lifelong Learning Educational Technology Professor Chris Dede, we have structured our inquiries into two key categories: Workforce development opportunities based on the research of the human brain and learning interventions that enable the application of research-based instructional moves.

Six Powerful Ideas

Moving beyond specific job preparation to lifelong workforce development, these lines of inquiry led us to six powerful ideas we hypothesize are necessary considerations for the workforce development sector to effectively prepare learners like Alice for a dynamic and uncertain future of work. The briefs that surround each of these powerful ideas take on big concepts while also being inherently pragmatic. They bring us down to the level of an individual learner, the learning environment they experience at a workforce

development organization, and instructional decisions, choices, and designs. The powerful ideas are about revolutionary change, not evolutionary change. It is easy to think about incorporating small aspects of each idea into practice; however, we will thrive as a sector only when we do ‘better things’ and stop trying to do ‘things better.’

Table 1: Six Powerful Ideas for Next Level Learning in Workforce Development:

- 1. Agency: Humans must be able to be agentic in their learning and be able to actively adjust their environment to be supportive of their growth and performance.*
- 2. Dispositions: By developing key dispositions we help improve an individual's capacity to apply the skills they have acquired in dynamic, uncertain situations such as the pandemic.*
- 3. Adaptive Expertise: Fostering tendencies of adaptive experts is critical to setting learners up for high-level performance in a changing world.*
- 4. Transfer: Agentic learners can transfer knowledge within malleable contexts that they can actively adjust to be supportive of their growth.*
- 5. Intelligence Augmentation: Workforce capacity building and development needs to shift from only reckoning to judgment with reckoning.*
- 6. Technology-Enabled: We can encourage learners to transfer learning, to develop dispositions well suited to changing circumstances, and to build adaptive expertise by leveraging what the learning sciences constitute as effective instructional design and by utilizing innovative learning technologies.*

The first powerful idea is the critical and foundational idea that humans must be able to be agentic in their learning and be able to actively adjust their environment to be supportive of their growth and performance. If we accept this as our vision of what an effective learner is, then the other five powerful ideas in this series become possible. However, many workforce development programs, organizational learning initiatives, and schools currently position learners as at a deficit or prioritize deep learning of specific content. To set learners up for a changing world we need to take learning to the next level, and we do that by fostering agentic learners. In the case of Alice, the program she enrolled in did not encourage her to be agentic. Instead, it focused on controlling her learning environment and experience by telling her what job to train for, what class to attend, what script to learn, etc.

The second powerful idea is an extension of Professor Chris Dede's work on the 60-year curriculum and lifelong learning. Dispositions such as growth mindset and tenacity help to determine an individual's capacity to apply the skills they have acquired in dynamic, uncertain situations such as the pandemic, as well as to thrive during shifts in roles or careers that do not yet exist. Traditionally, educators have viewed dispositions as fixed traits that individuals have. However recent research highlights that dispositions can be triggered, obstructed, and enhanced by environmental factors. Workforce development should be enhanced to inculcate and foster productive and prosocial dispositions. Alice initially had several useful dispositions, as evidenced by her proactive engagement in self-betterment and lifelong learning; however, her learning environment unfortunately did not reinforce these.

Our third powerful idea is that expertise that is adaptive and applied in many contexts is more important than deep knowledge for succeeding in rapidly shifting, uncertain contexts and situations. While we understand the tension that immediate economic inclusion is often the goal of workforce development, and that is usually attained through deep knowledge in a single thing. To not be negligent and irresponsible, we need to build adaptive experts. For Alice, deep knowledge of the electronic health record systems of 2018 was less helpful than if she had a novice level of understanding mixed with prompting to think about the many ways to apply her new knowledge. Adaptive experts can apply domain knowledge flexibly and rearrange their environments and thinking to tackle new problem spaces.

The fourth powerful idea came about in response to an inquiry into whether traditional upskilling, reskilling, new skilling, etc. are always the right response. Central to our interactions with learners is our mental model of what and who they are. For example, Alice was primarily seen as a low-income woman of color participant who needed job skills. We know that agentic learners in supportive learning environments can transfer relevant skills, knowledge, and abilities to multiple new environments and careers. ***Thus, our fourth powerful idea is that, by enabling empowered agentic learners through creating capacity building environments, the learners are well-positioned to draw upon current and prior learning to transfer relevant skills, knowledge, and abilities.*** Through this new Agentic Leveraged Contexts Model of Transfer, we move away from traditional conceptions that assume transfer just somehow happens, to a different strategy that makes achieving transfer deliberate and intentional.

The fifth powerful idea frames the context of the future before us. It highlights that we are training workers like Alice in skills that are – at their core – ‘reckoning’ or calculative skills. For example, Alice learned how to merge and reconcile two healthcare records with the same name in her Healthcare Management program. And yet, the reality before us is that, in addition to global disruptive forces such as the pandemic, Intelligent Automation is becoming increasingly adept at these reckoning skills. ***However, rather than entirely abandoning programs that involve reckoning skills, the powerful idea is that we instead teach them with a focus on judgment and applied wisdom skills.*** In this frame, we prepare workers to intelligently augment their artificial colleagues as machines become increasingly capable at reckoning.

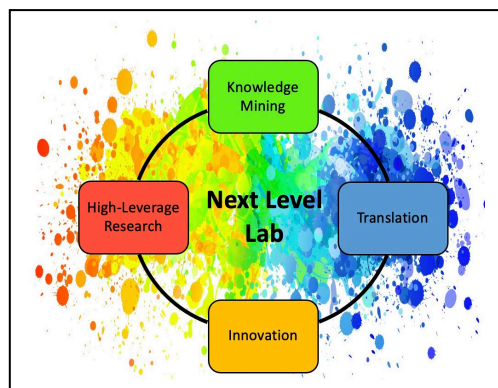
Our sixth, final and most consequential powerful idea builds on recent research that tells us that we can develop all trainees' judgment, transfer, dispositions, and adaptive expertise with well-designed educational interventions. To do so requires applying what we know from learning science research and instructional design to training experiences and environments that will support people in achieving these ambitious learning goals. There are many creative applications of technologies like Virtual Reality that can facilitate this, but so too can low-cost pedagogical decisions such as increasing learners' agency. That is to say that Alice's program could have taught her what she needed, had it aimed to promote deeper learning with smart instructional design. She was not destined to be financially worse off because the labor supply and demand equation changed.

Our exploration through both the knowledge and literature of our domains and the context of workforce development highlighted many puzzles, such as the tensions between job-specific skills and adaptability, scale and pedagogical rigor, or preparation for tomorrow or the future. These six powerful ideas do not give us all the answers we need to address these tensions, but they frame compelling contexts for practice-based research to start. Our frameworks are also not intended to be critical to the sector or the incredible people that work within it, but instead are designed to bring recent research to light to improve how we approach workforce development.

We hope you grant us forbearance in telling Alice's story in such detail and that it brings you a mental model to consider as you read each of the subsequent six powerful idea briefs. We look forward to your insights and appreciate your consideration.

About the Next Level Lab:

This work was developed through the Next Level Lab: Applying Cognitive Science for Access, Innovation, and Mastery (AIM) at the Harvard Graduate School of Education (HGSE) with funding from Accenture Corporate Giving (ACC). Any opinions, findings and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the funder. The Next Level Lab is pursuing this work as we articulate the findings from research in cognitive science, neuroscience, and learning sciences that inform approaches to education and workforce development. Our work sits at the intersection of mining extant research of promise; conducting research questions with the potential for high leverage impact; translating research on learning and the mind for public use; and innovating in the space of technology and learning to develop new visions for what is possible in developing human potential.



We are a small research lab. We view our mission as one of providing purpose and guidance to the field. Buckminster Fuller talked about the power of small influences in his description of a trimtab in this quote.

“Something hit me very hard once, thinking about what one little [person] could do. Think of the Queen Elizabeth again: The whole ship goes by and then comes the rudder. And there’s a tiny thing on the edge of the rudder called a trim tab. It’s a miniature rudder. Just moving that little trim tab builds a low pressure that pulls the rudder around. It takes almost no effort at all. So I said that the individual can be a trim tab. Society thinks it’s going right by you, that it’s left you altogether. But if you’re doing dynamic things mentally, the fact is that you can just put your foot out like that and the whole ship of state is going to turn around....”-Buckminster Fuller.

It is our hope that our small lab can function as a trimtab to create better outcomes for humankind.

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References and Further Sources

¹ LinkedIn Economic Graph (2017). LinkedIn Workforce Report, June, New York City, Accessed via: <https://www.linkedin.com/jobs/blog/linkedin-workforce-report-june-2017-new-york-ny> and LinkedIn Economic Graph (2018). LinkedIn Workforce Report, July, New York City, Accessed via: <https://www.linkedin.com/jobs/blog/linkedin-workforce-report-july-2018-new-york-ny>

² LinkedIn Economic Graph (2019). LinkedIn Workforce Report, May, New York City, Accessed via: <https://www.linkedin.com/jobs/blog/linkedin-workforce-report-may-2019-new-york-ny> And LinkedIn Economic Graph (2019). LinkedIn Workforce Report, October, New York City, Accessed via: <https://www.linkedin.com/jobs/blog/linkedin-workforce-report-october-2019-new-york-ny>

³ Goldstein, Amy (2017). *Janesville: An American story*, Simon & Schuster.

⁴ Encinas, J., Forshaw, T., Fuller., J.B., et.al (in press). *Mapping the future of education-and-employment: The US workforce development landscape*. Harvard University.

⁵ Khan, N, & Forshaw, T, (2017). New skills now: Inclusion in the digital economy, Accenture.

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