Learning Transition Design Principles for Learning and Employment Records: Co-designing for Equity

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About Digital Promise

Digital Promise is a global nonprofit working to expand opportunity for each learner. We work with educators, researchers, technology leaders, and communities to design, investigate, and scale up innovations that empower learners, especially those who've been historically and systematically excluded.

Our mission is to shape the future of learning and advance equitable education systems by bringing together solutions across research, practice, and technology.

Guided by our North Star Goals, we work to create big opportunities and tackle big challenges in education. Closing the Digital Learning Gap and unlocking the power of technology has long been a priority—but it's not all we do:

- Our research seeks to generate knowledge that empowers learning across the lifespan, centering equity in our work and focusing on how digital technologies can enable Powerful Learning.

- Our national networks connect forward-thinking educators, researchers, students, and others to identify and address shared priorities and challenges.

- Our programs empower educators and communities with resources and support to move ideas about learning and equity from aspirational concepts to tried-and-true practices.

Executive Summary

With the emergence of digital credentialing and platforms to support learners and workers with entering and traversing the increasingly skill-based education and workforce ecosystem, Learning and Employment Record (LER) technologies have been identified as a promising solution for individuals to share and access their learning- and skills-data and to education and career opportunities. However, learning journeys are rarely continuous; opportunities, challenges, and evolving circumstances can result in both the development of skills and competencies and a change in the way in which individuals demonstrate and get recognized for their skills and competencies. Further, systemic barriers and inequities disproportionately impact learning transitions for historically and systematically excluded (HSE) communities, barring access to supports and resources to enter and persist in the education and workforce ecosystem.

As the education and workforce ecosystem increasingly adapts to skills-based hiring approaches, it is critical for emerging technologies like LERs to be designed accessible and equitably for HSE communities to easily share and access their skills data. With generous support of the Bill & Melinda Gates Foundation, Digital Promise collaborated with HSE adult learners and workers, including those experiencing poverty and multilingual learners, to establish a set of design principles to inform the development of LER technologies for use over an individual's learning and career journeys, including their learning transitions. Through one-on-one interviews and group workshops with HSE adult learners and workers, key design principles have been identified to influence LER data infrastructure from education to the workforce.

To help inform the the design of LER technologies to be of value and useful in supporting HSE learners and workers during learning transitions and along multiple pathways, this report highlights the following:

1. co-design methodologies and experiences that center HSE learners and workers in LER design, development, and testing;

2. recommendations and insights from HSE learners and workers on the opportunities and challenges of utilizing LERs through education and career pathways; and

3. seven learning transition design principles that support the multiple and often fluid transitions between education and the workforce that many HSE communities experience.

These findings will inform our future work in developing a certification that guides developers to center HSE learners and workers as they design LER technologies to support individuals over time and through learning transitions. Based on these findings, LER developers, postsecondary education providers, and the workforce ecosystem, may develop a more inclusive skills-based learning and employment record system.

Introduction

> *"What is the point of a[n] LER if it doesn't help me get a job, a better job, or access to training or something? It sounds good. But what is the point?"*
> *— Participant A*

Throughout a person's life course[1] we traverse along multiple interconnected education, career, and life pathways. It is during these pathways that we make choices, are exposed to opportunities, face challenges, and experience transition—a change in our circumstance, experience, or movement to a different stage or role. Depending on the depth of change experienced and its significance in one's life, the transition may result in a person's growth or development, their skills and competencies. It may also change the way they need to share and demonstrate their skills and experiences with others in order to be successful during the transition. This is what we call *learning transitions* (Colley, 2007; Scott et al., 2013). During these transitions individuals often rely on disparate education and employment data and records stored and sourced from multiple systems and organizations and a self-attested and designed resume to demonstrate their skills, competencies, and credibility during learning transitions.

Systemic inequity exists in how learners and workers from historically and systematically excluded (HSE)[2] communities experience learning transitions across education, career, and life pathways (Johnson et al., 2014; Quillian et al., 2017). This includes inequitable access to support and resources to ensure they receive adequate opportunities to transition successfully (DeLuca et al., 2016). To empower equitable learning transition experiences requires us to recognize and dismantle inequitable systems that impede individuals from HSE communities from pursuing opportunities in education, careers, and lifelong learning. It also requires participation in the redesign and codesign of essential supports, services, and tools—digital and analog—which may help learners and workers to be successful during transitions along their pathways. Learning and Employment Records (LERs) and the technologies through which we may access and use LERs such as a digital wallets and backpacks have emerged as a technology with demonstrable promise for supporting learners and workers from HSE communities as they navigate learning transitions during postsecondary education, career, and experiences.

> **A Learning and Employment Record (LER)** is a digital data record of an individual's skills, experiences, and credentials that can be combined with other LERs and digital credentials to collectively make them visible for use in pursuing education, career, and life opportunities. A collection of LERs may include learning data and assets from across multiple education, employment, and life pathways, issuer and credentialing types. LER technologies refer to the stack of technologies used to access, store, edit, and share an individual's learning and employment record, making it of value during multiple pathways.

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[1] Life course is a holistic approach to the various interconnected sequences of events that take place over the course of a person's lifetime (Biesta & Tedder, 2007).

[2] Our work is centered on adult learners and workers who are historically and systematically excluded, including learners and workers who are Black, Brown and Indigenous; those experiencing poverty; multilingual learners; and learners and workers experiencing learning differences.

One of the promises of LERs is that they may make skills and competency data more accessible, visible, moveable, and useful to learners and workers during transitions, as well as stakeholders they interact with along education, career, and life pathways. It is in this that they promise to mitigate systemic barriers in education, hiring, and recruitment for learners and workers from HSE communities. This promise can only be achieved if LERs are undergirded by design principles developed with (not for) HSE learners and workers.

More often in technology design and development processes, and studies of technology use, the content experts—those building the technology—are elevated in time, space, and money. Very little consideration, space, or resources are given to the role of context experts. The context experts include people with lived experience of the situation, issues and problems the technology is promising to solve, and experientially know about the issue. In the absence of the context expertise of the HSE learners and workers closest to the challenges LERs aspire to mitigate, LERs may not adequately support HSE learners and workers, impacting their adoption and use (Goger et al., 2022). They may instead amplify existing inequalities and related barriers to supports, opportunities, and successful transitions, perpetuating systemic inequities in our post-secondary section and workforce systems.
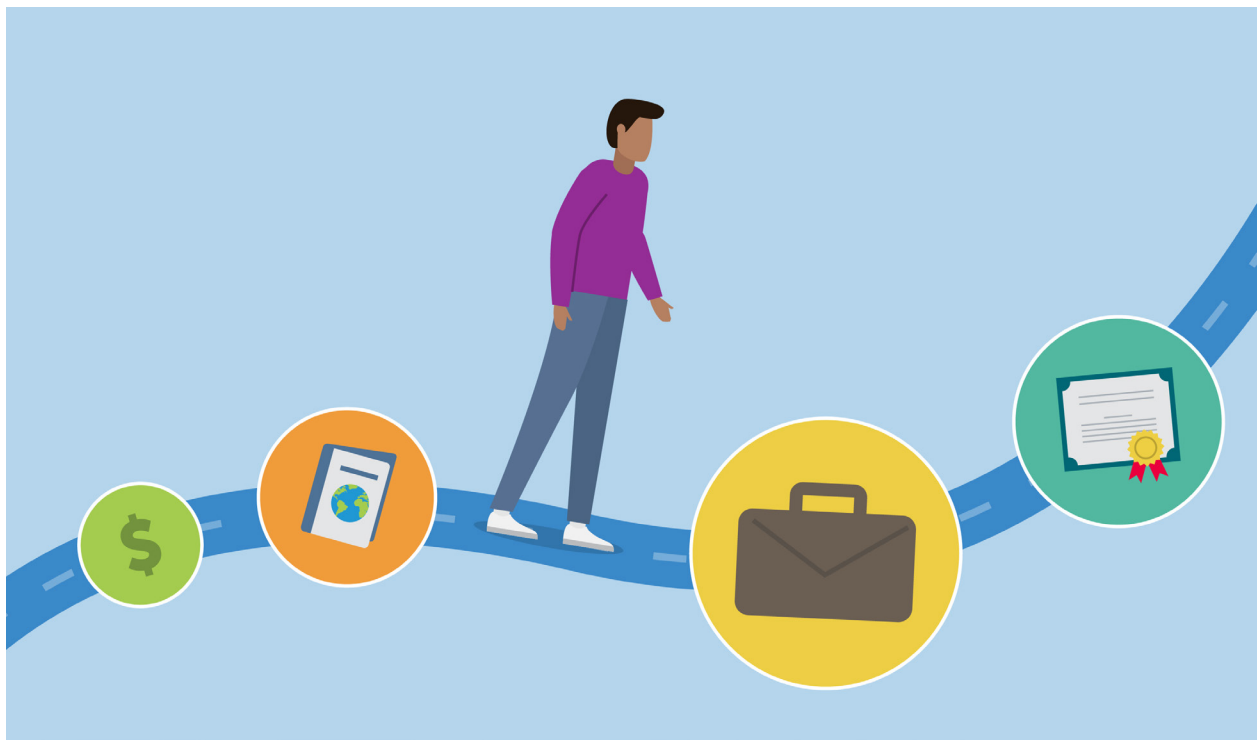
Learning Transitions

An Inclusive Approach to Learning Transitions

Most of the extant work on learning transitions is situated in a traditional conception of transition along a linear pathway—from home to nursery or preschool, from preschool to elementary and middle school, from primary to secondary school, from secondary to work and/or higher education, from education to work, into adult education and from one occupation to another in career changes (Biesta & Tedder, 2007). Feminist research, however, challenges such a theory as androcentric and reveals the many ways in which the time of women and people of color may be used and experienced differently (Constantine et al., 2007; Imray & Colley, 2017).

A more inclusive approach to learning transitions takes the following into consideration (Colley, 2007):

1. change and time as a natural flow of our lived experiences along as well as between multiple pathways;

2. life as a constant transition along our education, career, and life pathways;

3. learning as a permanent state in "becoming" and "unbecoming"; and

4. learning transitions defined by and centered in the life of the individual experiencing it, especially learners and workers from HSE communities.

> **Learning transitions** are a lived experience of learning change along a pathway related to a natural flow, a permanent state of becoming, a change in one's skills, knowledge and abilities centered in the point of view of the learner or worker experiencing them. The change in the learner may happen at the level of knowledge, skills, attitude, or behavior.

How we might describe the change and its impact on an individual's pathway depends on the individual experiencing it and the lived experiences that inform their perspective (Biesta & Tedder, 2007). The interplay between the events of transition and how the individual makes sense of the experience can change the direction of our education, career, or life path. Some examples of learning transitions include the following: In one's education, it could mean movement between schools (Swanson & Schneider, 1999), dropping out and graduating high school (Ghignoni et al., 2019), or starting a work-based learning apprenticeship or college program. In one's career, it could mean movement between jobs/employers, sectors (from teaching to healthcare), a sudden job loss and unemployment, and retirement. In one's life, it could mean movement between regions or countries, becoming a parent, getting divorced, or even transitioning from military service to civilian workforce. More often these contexts intersect, creating unique and nonlinear pathway dynamics.

In departure from traditional exclusionary conceptions of learning transitions and in alignment with critical feminist scholarship, we invited HSE learners and workers to define what constituted an impactful education, career, and life transition to them. This inductive approach allowed space to capture the diversity of lived experiences that impacted how transitions were initiated and experienced. It also created room to surface variation across cultural and individual sense-making about transitions from those that have not been centered in learning transition work to date. We also evolved from the traditional view of transitions along pathways as designed "for people" to instead being co-designed inclusively with learners and workers who are experiencing and/or have experienced transitions along their own pathway.

Historically and Systematically Excluded Communities

There is persistent evidence that mainstream curricular and instructional practices in education center white, middle-class cultural values and norms, resulting in the marginalization of students from diverse backgrounds (Rogoff, 2003). This is particularly evident in values such as individualism and competition, which are incongruent with the collective and communal values many students of color are familiar with. Consequently, learners from non-dominant groups carry the additional burden of bridging the gap between their home and school environments, while also striving to achieve academically (Tyler et al., 2016). Without adequate support this can lead to disengagement and lower academic performance. Additionally, the monocultural platform of mainstream curricular and instructional practice often discounts and dishonors knowledge and skills that emanate from other cultural communities. Thus, there are many skills that learners (and, in turn, workers) from diverse backgrounds have that are not formally recognized by learning institutions or employers (Goger et al., 2022). Both of these factors have a significant impact on matriculation and postsecondary education pursuits (Johnson et al., 2014) thereby perpetuating generational and long-term inequity.

> Prior to the pandemic, 70% of students from high-income families earned a bachelor's degree by age 25, while only 12% of students from low-income families managed to do the same [1]. Research indicates that the pandemic may have worsened these trends [2]. Although most low-income students begin their postsecondary education at community colleges, only 14% of community college students transfer to a university and complete a bachelor's degree within six years [3]. There are also significant racial disparities in postsecondary persistence and completion, with less than half of Black, Latinx, Native Hawaiian/Pacific Islander, and American Indian/Alaska Native students completing their degrees within six years, compared with 67% of white students and 72% of Asian students [4].
>
> Source: [1] Brookings (2015), [2] CCRC (2016), [3] National Student Clearinghouse (2021), [4] National Student Clearinghouse (2022).

Workers from HSE communities have long experienced rampant discrimination in work, hiring and employment (Quillian et al., 2017), even when credentialled (Gaddis, 2015). Confronted with the recent pandemic, they continue to face ongoing inequality and increased financial uncertainty due to job loss and rising unemployment (Richardson et al., 2021). As of April 2020 Latinx/e/o/a adults experienced employment losses at 61%, followed by Black Americans at 44%, and Caucasian adults at 38% (Lopez et al., 2020). Displaced Black and Latinx/e/o/a workers especially face a daunting reality with unemployment at 5% and 4.6% respectively, about 1–2% above the national unemployment of 3.5% (BLS, April 2023), making locating other employment challenging. There exists vast differences in resources and support before and during learning transitions (DeLuca et al., 2016) and the impact of experiencing these challenges as an extension of inequalities experienced earlier in life (Alexander et al., 2014).

LERs as Supports for Learning Transitions

During significant transitions, individuals often require support to manage the high degree of change impacting their work, study, and/or life (Almeida et al., 2022). It is during these inherently destabilizing periods that effective support services, tools, and technologies are most needed. Having access to learning and employment data and the ability to display evidence of skills, credentials, and experiences can help facilitate

a successful transition across systems and institutions. LERs may provide a more holistic, and potentially more accurate, representation of workers' and learners' knowledge, skills, and experience. This can be particularly beneficial for those who have gained skills through informal or non-degree pathways such as work-based learning, apprenticeships, and credit for prior experience (Palmer & Nguyen, 2019).

The success of LERs in supporting HSE learners and workers during transitions depends on their design and development. If designed for inclusion, they may contain more than an academic transcript and also include noncredit and non-degree experiences, co-curriculars, professional and continuing learning events, and other important milestones in a learner's life. In this, an LER may serve to empower learners in what and with whom they share and reshape the education and workforce ecosystem by better acknowledging learning that happens inside and outside of formal schooling.

While efforts to establish learner-centered design principles for LERs have emerged—with notable examples including Digital Promise's Inclusive Design Principles (Cacicio et al., 2022) and C-BEN's Interoperable Design Principles (Garrison Duncan, 2023)—there is a need to expand beyond inclusion and interoperability to also explore the usefulness of LERs for HSE learners and workers experiencing transition. The aim of the work is to codesign a series of Learning Transition Design Principles with HSE learners and workers who have experienced or are currently experiencing learning transitions. By providing insight to the following question, these principles aim to inform the development of LER technologies, pilots, and projects to support HSE learners and workers during their learning transitions and across multiple pathways.

How might we ensure the lived experiences of learners and workers inform the design of learning and employment record (LER) technologies so they are of value and useful in supporting people from HSE communities during learning transitions and along multiple pathways?

By developing design principles with HSE learners and workers we can better ensure that LER technologies serve their needs and disrupt the status quo of inequitable education, hiring, and recruitment practices by creating a more equitable, transparent, and inclusive, skills-based learning and employment record system. Together, 31 learners and workers from HSE communities co-designed seven learning transition design principles to guide the further development of LERs and associated LER technologies. This work surfaced three significant contributions to the field:

1	HSE learners and workers are rarely, if ever, invited to the design and development table and only rarely join the product use-testing table. We utilized responsive methodologies and codesigned experiences to include them along the LER design, development and testing journey.
2	In the process of codesigning with HSE learners and workers, we collected empirical evidence to interrogate vendor claims that LERs make hiring and recruitment more equitable and inclusive. HSE learners and workers shared their thoughts on the perceived impact, opportunities, and challenges of using LERs along their education, career, and life pathways.
3	The learning transition design principles focus on the value and usefulness of LERs to HSE learners and workers experiencing learning transition across multiple pathway contexts. This contributes to the existing LER design principles that focus on ease of use, access, and data/tech design, the Inclusive Design Principles (Cacicio et al., 2022) and Interoperable Design Principles (Garrison Duncan, 2023).

Co-designing for Equity

Drawing inspiration from Digital Promise's [Inclusive Innovation](#) approach to research and development, our goal was to connect with, engage, and center the voice of learners and workers who identify as members of HSE communities.

Our work at Digital Promise is centered on adult learners and workers who are historically and systematically excluded, including learners and workers who are Black, Brown and Indigenous; those experiencing poverty; multilingual learners; and learners and workers experiencing learning differences. In this study focused on informing technology that supports skills-based recognition, we were particularly interested in the experience of learners and workers who self-identify as groups protected by Equal Employment Opportunity[3] and Spanish-first language speakers. This study relied on methods that complemented both the study goals and were responsive to the needs of HSE learners and workers in this study. The following sections delve into the study methodology.

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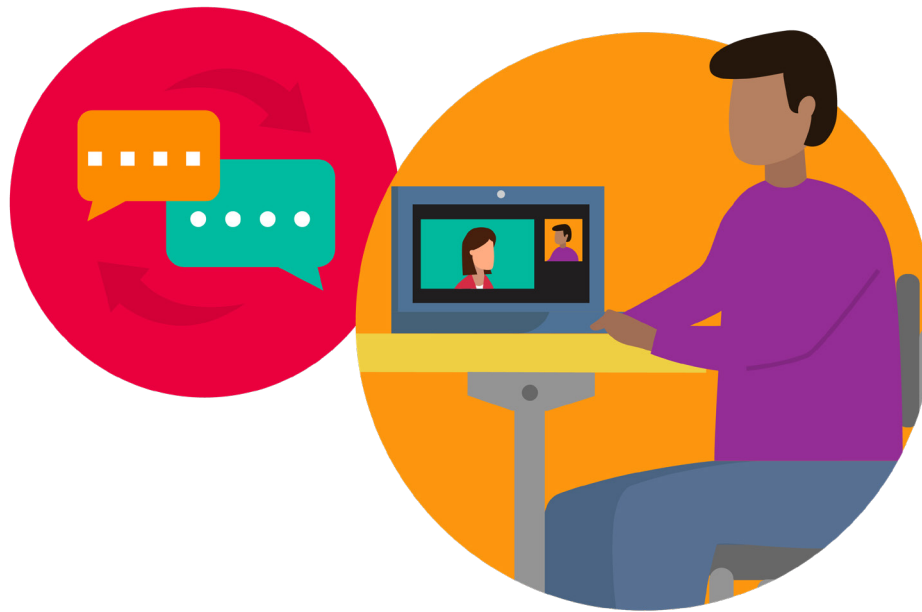
[3] Protected groups include the following: "race, color, religion, sex (including pregnancy, gender identity, and sexual orientation), national origin, age (40 or older), disability or genetic information." https://www.eeoc.gov/employees

Participant-Advisor Profile

To reach the individuals of interest, we collaborated with seven field partners who assisted with the recruitment of 31 learners and workers from across the U.S. To reach them, we developed recruitment materials (e.g., flyers, sign-up/registration forms, email, and web copy) in both English and Spanish, with details about the project purpose, engagement design, and participant-advisor compensation for lending their time and expertise. Participant-advisors were paid $200 per engagement session (three sessions for a maximum of $600).

The final group of participant-advisors varied in terms of digital fluency, work and career pathways, and transition experiences and included individuals with varying degrees of awareness and experience with the Learning and Employment Record (LER) technologies of focus for this project. Participant-advisors were employed in a variety of roles which included sectors such as military, technology, education, and healthcare and included those who identified as self-employed and currently not working. Seventy-four percent of the participant-advisors were English-first learners while 26% were Spanish-first learners.

Sample Profile - Recruitment and Engagement

Profile Criteria	Total	Spanish-first	English-first
Recruitment			
Registered	65	20	45
Followed up	58	13	35
Engagement			
Interviewed	31	8	23
Workshop 1	28	8	20
Workshop 2	27	8	19
Sample Rate			
Response Rate	48%	40%	51%
Retention Rate	87%	100%	83%

Source: LER Learning Transitions Project (January, 2023) Interviews (n=31) and Workshops (n=27–28).

The participant-advisors lived in 22 geographic locations across the USA and Mexico.
Participant-Advisors' Geographic Place of Residence

Participant-Advisor Experience

To recruit workers and learners from HSE communities for this project, we created recruitment materials such as registration forms (Google Forms), flyers, email, and web copies in both English and Spanish. These materials were distributed to field partners who then distributed the materials to their network of users to assist with recruitment. Participant-advisors were then contacted by a Digital Promise researcher via email to schedule one interview and two workshop sessions led by a Digital Promise researcher.

Over a period of six weeks, workers and learners from HSE communities were invited to engage in a virtual, one-on-one, semi-structured interview (60 minutes) and two virtual, semi-structured workshops (90 minutes each) in either English or Spanish. We first engaged them in one-on-one interviews to capture the variation in their individual lived experiences that are often missing from design processes and perspectives. During the interviews, participant-advisors were invited to share their stories about work, learning, and life and one story of transition they wished to reflect on for the purpose of this project. Following the interviews, participant-advisors were invited to engage in two small-group, co-design workshops in which they were able to co-construct ideas and technological possibilities for LERs together. Small group workshops created opportunities for collaboration and ideation across individuals from different levels of experience. Small groups also aided participant-advisors in articulating nuanced experiences related to social position factors (e.g., racialized experiences, class-based discrimination, etc.) as they explored shared experiences.

During each session we established a warm, safe, and inclusive experience for participant-advisors to share about their work, learning and transition experiences, as well as their ideas for LER technology development. To foster a safe environment for sharing personal testimony, we presented participant-advisors with a set of community agreements for group engagements (e.g., stay engaged, speak your truth responsibly, be willing to do things differently and experience discomfort, listen to understand, expect and accept non-closure and confidentiality) that came to Digital Promise through work we did with the Center for Equity and Inclusion.

During the first co-design workshop, we introduced participant-advisors to two of four LER technologies via video—Teacher Wallet (RANDA Solutions), MilGears (SOLID Inc), LearnCard (LEF), and Career Wallet (Velocity Network). Following each video we invited participant-advisors to share their responses to and thoughts on the LER technology designs and practical functionality (i.e., promotive or inhibitory factors) for individuals experiencing transitions. During the second co-design workshop, participant-advisors were given access to a shared Google Jamboard and were invited to share about what has supported them during transitions in the past, what they wished they had to support them, as well as their wishlist for the emerging LER technologies. At the end of the second workshop, participant-advisors shared five things which they believe LER technologies "should have/do" to support learners and workers from HSE communities who are experiencing transitions like them. All of their thoughts and ideas were shared aloud and self-reported on the Jamboard. An example of the ideation Jamboards are displayed in Figure 1.

Figure 1. Sample Workshop Design Element Ideation Jamboards (Workshop B2 & H2)

Source: LER Learning Transitions Project (January, 2023): Workshops (n=27–28).

Partner Profile and Experience

We collaborated with seven field partners to share about the project with their communities and networks. Our field partners spanned technology, education, and workforce development organizations across multiple regions such as Texas, Tennessee, California, Florida, and the District of Columbia, as well as partners with national reach. Together, we recruited 31 workers and learners from across the U.S. with a variety of work, learning, and transition experiences (see Appendix B for profiles about each partner).

Our technology partners made it possible for us to introduce HSE learners and workers to LER technologies, many of whom had never heard about digital and verifiable credentials, LER, or digital wallet technologies. Specifically, each partner delivered a 30–45-minute product walk-through presentation to our research team. This assisted our team in familiarizing ourselves with the specific language, functions, and features of each LER, as well as considering possible technology-use cases for each specific LER technology. We then invited each technology partner to create a five-minute introductory onboarding video that we then shared with workers and learners during the workshops. These videos provided a platform from which we could springboard into meaningful discussions about the LERs and how they could have provided support to the learners and workers during their transition experiences. These insights were shared with us as possibilities embedded in the stories of their lived experiences.

Analytic Strategy

We audio-recorded the interviews and workshops and used the professional service TranscribeMe! for transcription services in the language-first narrative text (e.g., either English-first or Spanish-first) of the speaker, ready for coding. Members of the Digital Promise research team who conducted the interviews and workshops completed the narrative coding of the transcripts using Dedoose (qualitative coding software).

First, researchers used inductive descriptive coding to identify seven first-level codes that mapped onto our topic areas of interest within participant-advisors' interview data. The research team communicated regularly to discuss any questions and discrepancies as they arose. Each transcript was double-coded by two researchers to ensure consistency across coders. Next, researchers used deductive coding to develop 45 second-level codes as they emerged from the data. Following the second-level coding, thematic analysis was used to identify common themes across participant-advisors. At the conclusion of the analysis, Digital Promise researchers engaged in member-checking with participant-advisors to ensure validity of our interpretations of the data. The same analytic process was used for workshop data and yielded seven codes and 32 second-level codes. All findings presented highlight themes that most commonly arose in conversations with and among participant-advisors across the following dimensions: learning transition experiences/stories, learning transition supports (previously used and desired supports), and LER technology perceptions (i.e., perceived challenges, opportunities, and desired features).

Learning Transition Stories

Learning transitions are best studied in context and not through disconnected or decontextualized methods (Colley, 2007; Scott et al., 2013) but through the exploration of events and practices in real-lived contexts for life-long learning along one's life course.

To achieve this we invited HSE learners and workers to share their personal experiences of transitioning between different contexts and the moments when they experienced the most learning and growth. Given the sensitive nature of sharing personal testimony, we took the time to build a relationship with them by learning about their life stories, educational and professional experiences, as well as how they identify themselves. We specifically asked them to share a story of a significant transition that they went through, one that had a profound impact on their learning and growth. We also inquired about a transition that required them to showcase their skills, experience, and credentials to others in order to succeed. This relational approach helped us to center our conversations and co-design sessions around their lived experiences and surface insights necessary for the development of LER design principles with—not for—HSE workers and learners. Accordingly, we named themes, categories, and insights that surfaced in our analysis in congruence with the language used by workers and learners.

Contextual Intersectionality

One key learning from the 31 stories of transition was that all learning transitions are intersectional, dynamic, and nonlinear, with people often experiencing multiple changes at the same time. The dominant contexts that influenced or framed their transitions included any multiple of the contexts displayed in Figure 2, such as a family, health or a job change, financial circumstance, retirement from military service, cultural and race-related transitions, and geographic movement.

Figure 2. Learning Transition Contextual Intersectionality
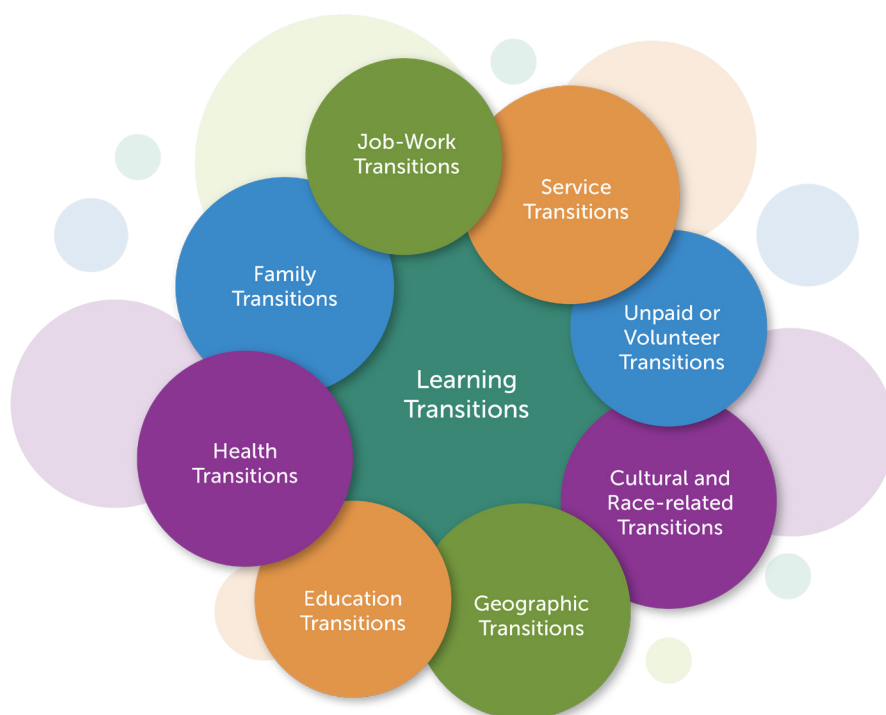
Featured Stories of Learning Transition

From the 31 stories collected, seven were selected to represent a variety of learning transitions. See Table 1. for a brief description and Appendix A for the detailed story.

Table 1. Featured Learning Transition Stories

	Learning Transition Story Brief Description
Participant A	Losing my bar job during COVID and transitioning into freelance digital work
Participant B	Transitioning from working in the school system to administration and DEI work in corporate
Participant C	Obtener la validación de mis credenciales de aprendizaje de Cuba / Obtaining validation of my learning credentials from Cuba in the United States
Participant D	Immigrating to the U.S. from Mexico and transitioning from a student and hospital-volunteer to a nurse
Participant E	Transitioning from living in Louisiana to Tennessee and finding work in a school in a new state
Participant F	In process of retiring from Marine Corps after 26 years and transitioning into the civilian workforce
Participant G	Transitioning from the Army after three years for college and again after 28 years to work in DEI for a biotech organization

Source: LER Learning Transitions Project (January, 2023) Interview total, n=31, stories featured, n=7. confidence, self-esteem, openness to change, and previous knowledge and experiences.

Learning Transition Supports

During the interviews and co-design workshops, participant-advisors explored their transition experiences and what supports were most useful to them during their transitions, as well as the supports they wished they had.

Transition Supports Used

Participant-advisors shared over 80 different supports they used during transitions. We grouped these into eight categories, with the top five supports displayed in Table 2.

- **People and connections** were the learning transition supports used, with participant-advisors mentioning support from friends, family members, peers, mentors, people who had gone through transitions, and their network.

- **Services** were the second most mentioned supports used during transitions. This included upskilling and reskilling programs, transitions and mentoring programs, resume writing services, recruitment, legal services, and job listing sites.

- **Myself** were examples of qualities and characteristics that supported participant-advisors. This included one's sense of self-confidence, problem solving skills, and ability to navigate uncertainty.

- **Tools and technologies** were resources, large and small, that had high utility during transitions. This included digital collaboration tools, planners, checklists, as well as internet access and reliable transportation.

- **Financial resources and time** were noted the least frequently. They included resources to meet basic needs and time to schedule appointments to access services.

Table 2. Top Five Supports Used During Transitions

Category	Workshop Participant-advisor Ideation
People and Connections	"Relationships (… family, friends/vets who had previously gone through the [military] retirement process)." (A2) "My last two transitions were possible because of connections I had." (B2) "El apoyo emocional de la familia." / "Emotional support from the family." (H1)
Services	"Department of Defense (DoD) SkillBridge/Hiring Our Heroes Program." (A2) "LinkedIn, Indeed .. all the job sites." (C2) "Consejero que también había pasado una transición similar." / "Counselor who had also gone through a similar transition." (H1)
Myself	"Good self-esteem and confidence." (B2) "Positive self-reinforcement." (C2) "Conocimientos y experiencias anteriores." / "Previous knowledge and experience." (G1) "El deseo de salir adelante." // "The desire to get ahead." (H2)
Tools and Technologies	Checklists, goal setting, daily planners, digital collaboration tools, like Zoom, Google Drive, employment navigators, the internet and transportation (A1-H1).
Financial resources and Time	"Los recursos financieros para acceder a las necesidades básicas." / "The financial resources to meet basic needs." (H1) "Time to perform most pre-retirement requirements [military], especially time to complete medical-related appointments and evaluations." (A2)

Source: LER Learning Transitions Project (January, 2023) Interviews (n=31) and Workshops (n=27–28). Workshops groups: English-First A1, A2, B1, B2, C1, C2, E1, & E2; Spanish-First G1, G2, H1, & H2.

Transition Supports Wanted

Participant-advisors shared over 70 transition supports they wanted or they felt they needed to help them during their transition experiences. We grouped these into 24 categories, with the top five supports dis-played in Table 4.

The top five supports included these:

- **More information** about the transition experience, certifications, job search, and new job;

- **Translation tools or services** specifically focused on skills and experience translation across contexts (e.g., military to civilian, teaching to nursing, school district to district);

- **Job training opportunities** for new jobs, job shadowing, and role onboarding;

- **Mentorship** or career/job counseling so you have a guide or support you can talk with; and

- **Money** in the form of college scholarships, stipends, GI bill or money to give more time or resources during transitions.

Participant-advisors also included in their discussions of support they most wanted, activities or mentoring on future vision activities like goal setting, planning and vision mapping, as well as using language translation services, access to better devices, more people support and reference support.

Table 4. Top 5 Supports Wanted During Transitions

Category	Participant-advisor Quotes
More Information	"Practical information, not just an info dump, about how to request, fund, and pursue certification and career development options before retiring; this would significantly help vets." (A2) "Falta de conocimiento para seguir con el proceso de superación relacionado con tu profession." / "Lack of knowledge to continue with the process of improvement related to your profession." (H2)
Translation Tool or Services	"Proper translation of military skills to the civilian workforce." (A2) "A good skills or experience translator." (B2)
Job Training Opportunities	"Training path for achieving 'x' or 'y' career development." (C2) "Time with the person I was replacing." (E2) "Capacitación para saber qué hacer correctamente en mi nuevo empleo." / "Training to know what to do correctly in my new job." (G2)
Mentorship or Counseling	"Mentorship, online mentor, sponsor, or counseling." (A2-G2) "Un consejero, que más que consejero, me guió. Muy profesional, me guió el consejero, un advisor, que también había pasado por el proceso, y me ayudó con su experiencia." // "A counselor, who more than counselor, guided me. Very professional, the counselor, an advisor, who had also gone through the process, guided me and helped me with his experience." (H2)
Money	"More money, finance, access to a college fund, or personal assets." (A2-G2)

Source: LER Learning Transitions Project (January, 2023) Interviews (n=31) and Workshops (n=27–28). Workshops groups: English-First A1, A2, B1, B2, C1, C2, E1, & E2; Spanish-First G1, G2, H1, & H2

LER Technology Reflections

We invited the participant-advisors to reflect on the perceived challenges and opportunities of using LERs to support workers and learners during transition and to ideate their wishlist of what they wanted an LER to have or do in order to support people like them specifically during transitions.

Perceived Challenges

Participant-advisors shared over 72 perceived challenges of using the LERs we showcased during transitions. We grouped these into 22 categories, with the Top 15 challenges displayed in Appendix C. The top five challenges included these (Table 5):

- Concern over the **accuracy or completeness** of the information stored in an LER;

- **Safety or security** of the information stored in the LER;

- Knowing **how to use** an LER effectively, as well as what it can be used for;

- Concern about whether **employers actually use LERs**; and

- Worry **as to how to access them**, keep access to them, and what to do if access is lost.

Table 5. Top Five Perceived Challenges of Using LERs to Support Transitions

Top Five	Participant-advisor Quotes
Accuracy & Completeness of Information	"If translated wrong it could lead someone down the wrong path." (B1) "Inaccurate information, or outdated suggestion based on previous work history." (E1)
Safety and Security of Information	"Is our information safe? Is there a two-factor identification when logging in?" (E1) "Confiar en la seguridad de la información." // "Relying on information security." (H1)
Knowing How to Use the LER	"Both employers and those experiencing transitions may not even know what an LER is so they may not understand its value." (A1) "El desafío seria aprender cómo usar la aplicación correctamente." / "The challenge would be to learn how to use the application correctly." (G1)
Employer Use of LERs	"Will employers accept these particular outputs?" (A1)" "Can employers add verifications to LER?" (B1) "It would only be successful if used by both the service member and civilian entity." (E1)
Access/Losing Access to LER	"Access to their electronic documents (i.e., service records, Joint Services Transcript, VMET, etc.)." (A1) "Difficulties for accessing the tools (not remembering the application address, loss of phone, lost credentials, lack of usage, etc.)."(C1)

Source: LER Learning Transitions Project (January, 2023) Interviews (n=31) and Workshops (n=27–28). Workshops groups: English-First A1, A2, B1, B2, C1, C2, E1, & E2; Spanish-First G1, G2, H1, & H2.

Perceived Opportunities

Participant-advisors shared over 56 perceived opportunities of using LERs for support during transitions. We grouped these into 21 categories, with the Top 15 opportunities displayed in Appendix C. The top five opportunities included these (Table 6):

- Having **everything in one place** as opposed to in multiple locations and sites;

- **Matchmaking** people to jobs and opportunities;

- **Convenience** of accessing your information and credentials;

- **Auto-translation and integration** of skills, experience, work and education data; and

- **Search for** career, job, or education opportunities based on LER data.

Table 6. Top Five Perceived Opportunities of Using LERs to Support Transitions

Top 5 Opportunities	Workshop Quotes
Everything in One Place	"Having everything digitized and in one place." (A1) "Having all of your education, training, and experience in one, easy-to-find location. More efficiency in resume creation and accuracy." (E1)
Matchmaking People to Jobs	"Help align you to opportunities that are most suited to your skills." (A1) "Intelligent database that can decipher education/experience to match with potential careers." (E1)
Convenience	"The convenience of carrying all your credentials with you." (C1) "Acceso inmediato a la documentación." / "Immediate access to documentation." (H1) "I thought about my father, who is a retired veteran, and how awesome something like this would've been for him now that he's older and just trying to keep track of just information when he goes to the VA as he's starting to forget things now." (A1).
Auto-Translation of Skills and Experiences	"A good starting point to help translate their experience." (B1) "Potential translation of military knowledge, skills, schools, and training into terms understandable by civilian employers." (A1)
Career Search	"You can see hot job trends and find jobs in your local area." (A1) "Simplifica el proceso de estudiar y buscar empleo." / "Simplifies the process of studying and searching for a job." (H1)
Visibility	"A better way to present your strengths." (A1) "Demostrar Conocimientos y habilidades." / Demonstrate Knowledge and Skills. (G1)

Source: LER Learning Transitions Project (January, 2023) Interviews (n=31) and Workshops (n=27-28). Workshops groups: English-First A1, A2, B1, B2, C1, C2, E1, & E2; Spanish-First G1, G2, H1, & H2.

An LER Wishlist

We invited participant-advisors to share a wishlist regarding what they wanted an LER to offer individuals undergoing transitions. Over 100 ideas were shared, spanning 45 different categories. The top 30 ideas have been included in Appendix C. A number of wishlist items coincide with the perceived challenges workers and learners may encounter while using LERs. These items highlight the particular areas that the next generation of LERs should focus on in order to overcome the gaps recognized by this group of HSE workers and learners. The top five things an LER must have or should include to support HSE workers and learners are these:

- **security and privacy** of our data and information;

- **matchmaking** feature or tool to match people to opportunities;

- **resources** such as guides and articles to educate people about transitions;

- **verification and validation** indicators of all types of data, information, and credentials; and

- **a one-stop place** for all work and learning data and information.

Learning Transition Design Principles

Design principles are a set of guidelines that designers and developers can follow when creating an experience, product, program, or innovation. The purpose of these rules is to communicate organized and functional guidance for the design team to consider throughout the development process. In effect, design principles both guide design and development work, as well as serve as evaluation criteria for designs that already exist.

In addition to efforts in early LER development to establish Interoperable Design Principles (Garrison Duncan, 2023) for the data and technical design of an LER and Inclusive Design Principles (Cacicio et al., 2022) to ensure workers and learners voice on access, privacy, and ease of use, there is still much work to be done to ensure that LERs are of value and useful to HSE learners and workers. To contribute, the Learning Transition Design Principles focus on the value and usefulness of the LER for HSE learners and workers experiencing learning transitions.

To develop the Learning Transition Design Principles for LER technologies, we centered our analysis in transition stories collected via interviews and co-design sessions with HSE workers and learners. These design principles provide LER developers, vendors, and pilot partners insights to create more effective LER technologies for application and use across the diversity of learning transitions experienced by learners and workers. Further, they will also serve to guide users of LERs, be they organizational or individual end-users, with a set of criteria to evaluate the technologies during selection, onboarding, and adoption process.

The Learning Transition Design Principles for LERs developed are summarized in Table 7 and discussed in the following pages.

Table 7. Learning Transition Design Principles for LERs

Learning Transition Design Principles for LERs	
Learning and Employment Record (LER) technology should achieve the following:	
1. Connect people to supports 2. Connect people to opportunities 3. Include indicators of skills and learning 4. Be inclusive of people's identity, movement, and language	5. Empower people with skills-based practices 6. Adopt a comprehensive approach to digital credentialing 7. Integrate with a variety of tools

Principle 1: Connect People to Supports
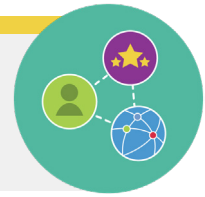
LER technologies should share with and/or match people to supports

LER technologies should be able to, with user consent, be shared with and/or match people to the following:

- people who may support them during a transition,

- mentors and academic/career/transition counselors and services, and

- career and/or professional social networking services.

LERs should be shared with and/or match people to people who may support them during learning transitions.

People we have strong-tie relationships with are one of the most important supports used during education, career, and life transitions. A strong-tie relationship is usually formed between close acquaintances through frequent interaction and shared values (Zenou, 2015). Participant-advisors mentioned how important the support of close-tie relationships like family and friends was during their learning transitions. For many, sharing the transition experience, getting their help with resume writing, or thoughts on possible job opportunities as they progressed through the transition was very important. One possibility for an LER to support this is to have the functionality of the LER or data from it being shared with or viewed by someone with guest approved access. This was especially important for Spanish-first language participant-advisors and veterans, given their transition from living in a very supportive environment while in the military to feeling a sense of loss or inadequate support during transition to civilian living.

> *"I think it's a matter of not being alone to feel that you have something or somebody that you can approach and help you through the transition." (C2)*

> *"I think it's important to have that sense of community, right, that sense of belonging. All branches included, all Military Occupational Specialties (MOSs), etc. Because that would be a strategic advantage I would see, because that's the environment that service members are coming from. They're coming from that tight knit community where maybe a place to be the buffer between what they used to say and how they're supposed to say it now [inaudible] that kind of thing. But that community where ideas can be bounced off of communication can happen." (E2)*

Participant-advisors mentioned mentors, advisors, and people who had gone through a similar transition themselves. These social connections allow individuals to not only learn from each other but see the

possibilities their futures hold in a different way other than looking at lists of educational programs or job opportunities. In the design of LERs, we mainly focus on the ways skills-data might be used to match people to jobs and education opportunities. In this project, participant-advisors shared the possibility of the skills-data in an LER to be used to match them to people in some way who might support them or people who've done the job before or have experienced similar transitions.

> *"I think one of the attractions to that would be that community. That place that I can always go and still talk with people that understand what we're going through." (E2)*

> *"Un advisor que tenga empatía y pueda guiar." // "An advisor who is empathetic and can guide." (H2)*

LERs should be shared with and/or match people to mentors and career/transition services.

Career and adult education services were the second most used support by Participant-advisors. They emphasized critically important services during transitions, such as up/reskilling programs, degree translation services and mentoring programs, resume writing services, recruitment, legal and visa services, and job listing sites. Skills-data in an LER could be used to match or recommend services to people, such as mentoring, transition and careers counseling.

> *"And one of the things I do too when I mentor current service members is I tell them you got to find two in front, two parallel, and then two behind. Find your two people that have already done it for you, that are already transitioned, are successful, two that are going through the process right now so you can bounce stuff off of each other and two people because if somebody at some point in time I know everybody here has had somebody reach back and help them, whether it's just advice or what to do, or what to expect, or sometimes just a phone call to say, "How you doing?" Right? Your job is then to reach back and find two more. So you got the two ahead, the two parallel, the two behind, and that's good for well, that's good for everybody here." (E2)*

> *"You had that support system when you were in school, when you're in college. You could go to teachers and professors. Same in the military. You could talk to whoever you need to talk to. And once you got outside, what happened? They went away. And you're like, "Oh, what do I do now?" So that support system, that's missing when you transition." (Participant H).*

Participant-advisors discussed the possibility of their data in an LER, be it identity, location, or interests and preferences, being used to match or refer them to services that may be of value by the type of service needed (e.g., mentoring, resume building, interview training) or by their geographic region.

> *"Like a sponsorship program with a mentor who calls, listens, and like, "Hey, I've done this for the last 23 years," kind of talking to Participant I there when I was joking with him earlier, "I'm marketable for these reasons. What do you see?" And something more than when you call a normal helpline that says and they read from a script. Somebody who is actually knowledgeable says, "Okay, cool." That individual person can look at your records and say, "Hey, I've seen this over time. This is what I believe. Here's career fields within your state, your region even, that I believe you need to reach out to." (E1)*

LER technologies should connect people to professional or career networks.

Networking was regarded as another very important support for learners and workers experiencing transition, with nearly all participant-advisors using some form of career social networking site such as LinkedIn or Indeed. They also engaged in face-to-face ways to network such as events, conferences, and careers fairs. Most of the participant-advisors expressed that networking was "essential," "most important", and, to a couple of workers, "if not more important than my credentials" when ensuring they were successful during transition.

> *"Biggest takeaway is that networking is probably the single most important thing than any other thing that you're going to do when you're transitioning. Resumes or resume. You're going to have to tailor it … but building a network of people that can help you through that process is important." (B1)*

> *"My learning was that networking is essential." (B1)*

> *"I think it's really interesting a lot of what we're sharing is around it's not so much about my credentials; it's the network, the mentor, and everything else around it." (B1)*

If the data in an LER could also help in the matching of people to networking opportunities or serve in some way to help connect them to like-minded or field-specific groups for networking and professional networks, this would further serve to support people during their transition.

> *1: "Does it have [a place] where you can build a network on there as well?*
> *2: "I was thinking the same thing. Yeah!"*
> *1: "And have connections? That might be the only thing missing now." (C1)*

> *"So one of mine is communities for employees in similar roles. And I see that it's connecting me to professionals from my field." (A2)*

> *"So you need to have somebody that has somewhat of a background of what you did. It's like for Participant F, if he's a builder, he should be talking to somebody that's done building for years or a health care adviser. You get somebody that's not related to what he's doing on the back side of it, you just wasted your time. And it's not going to help you. You're going to get discouraged on that aspect of it. So that's the way I'm seeing this. It's a great idea to have someone to talk to, but if they're reading from a script or don't have a clue of what you did." (E1)*

Principle 2: Connect People to Opportunities

LER technologies should connect people to earning, learning, and resource opportunities during transition
LER technologies should connect people, with their consent, to the following: • job, work, and/or career earning opportunities; • learning, development, and/or education opportunities; and • money, time, and/or resource opportunities.

LER technologies should connect people to job, work, and career earning opportunities.

When exploring what success means to participant-advisors during transition, it was unanimously shared that "getting a job," "getting a good job," "getting into college or a program," "advancing in my career," and "getting paid more" were the main ways participant-advisors felt successful following a transition. An important implication of these findings is that LERs should help connect people to work opportunities or the employers who might have job opportunities.

> *"Connect us to employers because if you're not connecting me to an employer, then why do I even need to use the LER, you know what I mean? That's definitely the goal of it, right?" (E2)*

> *"Que ayude a conseguir un mejor trabajo, que me conecte con posibles empleadores basado en mi portfolio." // "Help me get a better job, connect me with potential employers based on my portfolio." (H2)*

> *"If I upload it, then there's a database of employers that says, ''Hey, I'm looking for people that possess X'' kind of like on LinkedIn when you, when you look at a job posting and it'll tell you how you stack against other applicants or say you possess six of these 13 skills. Something like that. But directly to an employer like the inverse where you're looking to see if your skills match them, they get something that says, ''Hey, these skills match us.'' (B2)*

LER technologies should connect people to learning, development, or education opportunities.

Many participant-advisors indicated a need to access education and training opportunities when experiencing transitions so that they could upskill or reskill further developing their competencies to support their transition goals. The data and information in an LER could be used to match people to suggested education and training opportunities.

"Well, I think the integration piece was pulling information from colleges, not necessarily sending the data to colleges, but I could see it both ways if you're wanting to apply for a program or some sort of experience it could match you." (B2)

"Connect us to employers because if you're not connecting me to an employer, then why do I even need to use the LER, you know what I mean? That's definitely the goal of it, right?" (E2)

LER technologies should connect people to money, time, or resource opportunities.

Participant-advisors wondered whether their data and information in an LER could be used to match them to financial opportunities, thereby saving them time and money. This showed up in a number of ways. One suggestion was to provide access to a certification or program finder, such as CareerOne or Certification Lookup, with free and low cost programs that match to your learning needs and location. Another was for veterans to be matched with educational options that are free for veterans or VA-approved for GI Bill Benefits.

"Something in there that highlights if you have skills towards the credentials, and they know that there's so many organizations out there that offer free credentialing for certain credentials for veterans after your transition out. And you don't have to use the GI Bill, or they can match the financial options to education programs available." (A1)

"I have [used] Certification Finder, [a] resource for low cost or free programs. And I see somebody choose transition counseling, help evaluate skills, connect me to opportunities." (A2)

Transition is both a timely and costly endeavor. Money and time were the main two resources participant-advisors felt they needed to be successful during their transitions. It is often very costly to collect multiple sources of evidence and documentation, and usually access to these materials has a fee. One of the resource opportunities was the perceived cost savings of having a digitally certified copy of an education credential, ensuring that, once paid for, they would not have to pay for it again. If an LER could effectively demonstrate the cost savings to people, they may be more likely to adopt it.

"Yeah, so if I had a digitally certified copy of my bachelor's degree, then I wouldn't need to pay to have another [inaudible] envelope for my master's degree." (B2)

Principle 3: Include Indicators of Skills- and Learning Add
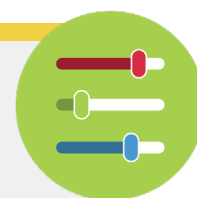
LER technologies should include indicators of skills- and learning add
LER technologies should include these: • indicators of learners' social-emotional and/or 21st century skills, • indicators of learners' skills-add to a role or an organization, and • information about their learning development and aspirations.

LER technologies should include their durable skills.

Social-emotional skills are important skills for workplace readiness, education, and employment success (Guerra et al., 2014; Rios et al., 2020). Participant-advisors shared that, in addition to being able to make visible their technical, work, and experience-related skills and competencies, they also wanted the LER to enable them to share indicators of their social-emotional and 21st century skills (e.g., oral and written communication, collaboration, and problem-solving skills)[4]. The ways a person might demonstrate these in an LER could be through integrating recommendation and reference letters, as well as performance evaluations and employee-peer or customer reviews.

> *"I'm sure it'll vary from industry to industry, but [...] even in the military, your performance evaluations are what will capture those soft skills." (B1)*

> *"I think, for me, it seems like there's multiple emphasis on skills translating that aren't technical skills like soft skills that seems to be one that's jumping out. It's being said in different ways." (B2)*

> *"If there's a way to validate those soft skills and show that validation in the system from a hiring perspective. So I work in healthcare, and, minus our nurses and doctors, a lot of the positions that we hire [...] really we're looking for the soft skills more than the hard skills nowadays. It's easy to teach someone a hard skill. It's hard to teach them the soft skills of difficult conversations or critical thinking or leadership, and the myriad of stuff continues and goes on and on in the soft skills." (B1)*

[4] 21st century skills refer to the knowledge, life skills, career skills, habits, and traits that are critically important for success in today's world, particularly as people transition through college, the workforce, and adult life (Binkley et al., 2012).

LER technologies should include indicators of the skills-add a person brings to a role, program, or organization.

Hiring for skills-add is important for organizational innovation and sustainability as well as for employee health and wellbeing. Further, when you hire to add diversity to your team's skills and competencies, it means hiring people who bring something new to the organization (Prieto et al., 2009). Consistently, participant-advisors shared that while matching skills-jobs (or job descriptions, job advertisements) was valuable, they should also have the ability to show the skills, backgrounds, and experiences that also "add-skills" to the role, work and/or organization. This will show they have more to contribute beyond the requirements included in a job description or advertisement.

> *"It's good for technical stuff. But at the end of the day, most jobs are about people, culture-add, fit, relationship building. So if the tool isn't really going to tell that story for me ..." (B2)*

> *"Guiado por la investigación de cómo los diferentes grupos culturales aprenden." //
> "Guided by the research on how different cultural groups learn." (G2)*

LER technologies should include information about a person's learning development and aspirations.

Transition is not just about where someone has been and the skills and experiences they have today. It is also about where they are going and the skills and competencies they aim and have the possibility to develop into the future. Participant-advisors shared they really wanted LERs to include indicators of learning capabilities and their mindset for learning.

> *"If you hire the person who has all of the skills that you think would make the perfect candidate, they're still going to have to learn on the job. That's just an absolute. I mean, things don't stay the same. You're going to need people to learn ongoing for the rest of their lives. So if I've shown that I am capable of learning and eager and have some experience and documentation that shows that I learn quickly and add other skills and experiences to your organizations, then give me a chance." (B1)*

4

Principle 4: Be Inclusive of People's Identity, Movement and Language

> **LER technologies should be inclusive of people's identity, movement and language needs**
>
> LER technologies should enable people to share, with their consent, these elements:
>
> • intersectional identities and representations,
>
> • migration and immigration documentation and service needs, and
>
> • language translation and/or display option needs.

LER technologies should enable people to share, with their consent, their intersectional identities and representations.

It is during a transition to a job or program, at which people are often asked to indicate how they identify on a series of geo-demographic indicators. These can include age, gender, pronouns, racial and ethnic identity, as well as economic and geographic identity. The U.S. Equal Employment Opportunity Commission (EEOC) has specific rules for companies that hire 100 or more employees. These rules include practicing fair hiring with specific guidelines covering how this should occur. To comply, organizations often ask candidates demographic questions about race, gender, and veteran status to determine whether their job postings are attracting diverse candidates and to help them create a workforce that meets both the EEOC requirements and their own internal goals for diversity.

With this in mind, it is very important that an LER be inclusive of the multiple ways people may identify, if they wish to include or share it. Collecting this information and its inclusion in an LER should also be optional with an opt-out feature to seek consent. Given the very personal nature of learning and work and its connectedness to racial, cultural, and ethnic identity and needs, it is important that LER technologies be representational in a diversity of racial, ethnic, and cultural identities and ways of expression.

> *"Pero siempre he pensado que no hablar como ellos, que no haberme graduado en las universidades de ellos cuando digo "ellos", digo las personas que nacieron aquí, los profesionales igual que yo. Siempre me ha parecido que me coloca en desventaja." // "But I have always thought that not speaking like them, that not having graduated from their universities, when I say "them," I mean the people who were born here, the professionals just like me. It has always seemed to me that it puts me at a disadvantage." (Participant C)*

> *"Well, for me personally, I'm dyslexic. So taking tests, taking exams, doing certain tasks, depending on what it is, is always hard for me. So I was always behind the curve on certain things. So I had to learn a different way and in the Coast Guard. So I was kind of penalized from the beginning because we don't have programs in the Coast Guard for people like me. It's just what they did." (Participant I)*

> *"Mostly, I would say no. I'm not having the success I would like in finding a job right now. And I am getting older, so that's a possibility. So I wouldn't rule out that there's age discrimination." (Participant J)*

LER technologies should enable people to share, with their consent, their migration, immigration documentation and service needs.

Different states in the U.S. often have different licensing and certification requirements for a variety of careers and industries. You may be a licensed teacher, nurse, or contractor in one state, yet it may not be recognized in another state. An LER being able to identify in which states they have certification equivalency or require further documentation would be of immense value in this circumstance of state-transitions, saving people time and money.

> *"I have a relative that's a travel nurse. Every time she travels, she needs to know what certifications she needs or the update on the [new state] she's going to. So yeah, that would be something that could be added there as well for the travel nurses, maybe." (E1)*

> *"I work with a lot of military spouses that are teachers, and they come from state to state. And the Army and other forces have started reimbursing families to pay to update their state credentials. What would be nice is if you uploaded an Oklahoma credential and the system would recognize to what states that that credential is validated in. So that way, you know, hey, if I'm moving to Washington, my credential is not good ... or the state of Washington requires these things." (E1)*

In terms of international movement, there were 28 million foreign-born workers in the United States in 2021. They made up 17% of the total workforce (BLS, 2021). For all, they require work visas as well as evidence and documentation of their education experiences from international institutions and in multiple languages. To go to school in the U.S., international students have to show evidence that they have English-language proficiency. Non-U.S. citizens always need to carry proof of residency and authorization to remain by immigration law, demonstrated by a green card, work, travel, or other visa class. Being able to easily locate this information by having it accessible in digital and verifiable form will serve to support people during transitions.

> "Menú incluye ítems, muchos ítems específicos. Por ejemplo, con información básica para migrantes recientes, incluir agencias que homologan los títulos con los precios y los horarios, el proceso para enrolarse para estudiar, típicamente cuáles son los documentos que requieren los empleadores. Otro ítem, con otra especificidad diferente. O sea, eso es lo que quiero decir, un menú que sirva a los propósitos de los usuarios, que el usuario pueda encontrar algo para él, regardless de su cultura, de dónde venga y de cuándo venga." H2 // "Menu includes items, many specific items. For example, with basic information for recent immigrants, include agencies that standardize titles with prices and hours, the process to enroll to study, typically what are the documents that employers require. Another item, with a different specificity. In other words, that is what I mean, a menu that serves the purposes of the users, that the user can find something for him, regardless of his culture, where he comes from and when he comes from." (H2)

LERs should have multiple language translation and/or display options.

We are living and working in an international and interconnected world. With this comes the need to be responsive to the language needs of travelers, non-U.S. born, and English as second language learners and workers. Participant-advisors shared stories of having their education and work information in Spanish, or their education credentials in French, and recommendation letters or references in Portuguese. They also expressed difficulty in fully being able to express and share their skills, data, work, and education information. LERs should have multiple language translation and/or display options to support learners and workers who identify as English as their second or non-dominant language.

> "It was really hard. It was really stressful. And then I also think because of my I'm from Mexico, so my primary language is Spanish. So I have a challenge with English." (Participant D)

> "La plataforma debe tener un language option." // "The platform must have a language option." (H2)

> "El multiple language, que sea multilingual, cultural sensitivity." The multiple language, that is multilingual, cultural sensitivity." (H2)

> "I see that [inaudible] kind of important feature that can be incorporated because I see in terms of translating different language for people, may be different, let's say, in terms of their ethnicity, they say in terms of Spanish and Portuguese, as the case may be, to try to kind of understand. Because at some point, it's not everyone that really, really understands English. But I think even if a different language is being put into play, it will go a very long way." (B2)

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[5] "persons residing in the United States who were not U.S. citizens at birth." That includes "legally-admitted immigrants, refugees, temporary residents such as students and temporary workers, and undocumented immigrants. (BLS)"

5

Principle 5: Empower People with Skills-based Practices
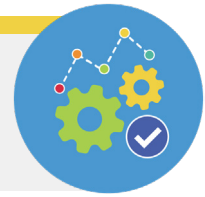
LER technologies should enable people to effectively organize, have translated, and evaluate their skills-data, information, and credentials
LER technologies should achieve the following: • enable people to organize their skills data, information, and credentials; • integrate with a skill-credential translation tool or service; and • integrate with a skill-credential evaluation tool or service

LERs should enable people to organize their skills-data, information, and credentials.

People experience thousands of learning and work events throughout their life. At each, they may develop their skills and competencies and collect learning and work assets which provide demonstrable evidence as to their skills and competences. While viewing the LERs shown in this study, participant-advisors asked questions about how they might organize all the information that issuers or peers have pushed to their LER. This functionality was deemed important so people can make sense of the data, as well as select what from an LER may be of value to them if easily and meaningfully accessible.

> *"Having all of that in place and being able to pull from a lot of the information that is here would have been very helpful." (A1)*

> *"I like it was user-friendly, and you are able to upload. And I saw where ETS [Educational Testing Service], if you've done any kind of credentials or certifications through ETS, as far as getting your transcripts and everything, you're able to go in there and … pull all of that, and you can keep all of that in one central location." (A1)*

> *"I don't know. It could be similar to having, I don't know, probably a web container or drive where you can put different diplomas or things, I mean, PDFs or something like that but stored in a single file on a network." (C1)*

LERs should integrate with a skills-translation tool or service.

Making a career change such as moving from working in healthcare to education or military workforce to civilian means learning how to communicate your skills effectively in the language of your new chosen field. Looking over job descriptions or advertisements and industry news to learn and mimic the keywords and jargon used in this industry will only help you so much. Learners and workers expressed a need for the LER to have a feature or to integrate with a skills-translation tool or service that would provide suggestions on how to present their skills, effectively translating them. This was specifically of value to veterans retiring after 15–20+ years of service and needing to translate the skills developed over this time for communicating within a civilian sector.

" ... especially when you're transitioning out of the military, we have captured a lot of things in here where you have to be able to translate the skills that you learned working in the Department of Defense or in the military to the civilian sector." (B1)

"I want the LER to be able to help me translate my skills effectively and efficiently. ... It's something like ... you upload your PDFs, automatically sees it, scans it, pulls it in. You don't have to manually load anything. But the PDF scanned in, the system takes the ability to take all those skills across for me. Like I've said, 23 years worth of documents." (E2).

"I've gained a lot of skills along the way. So for me, in the transition, the one thing that took too long, it took too long to realize is I'm more marketable based on the what's the word I'm looking for? Soft skills, hard skills. The soft skills that I've learned along the way to where I'm a leader, I'm a manager, I'm a financier, I'm a budgeteer, I'm X, Y, and Z, more so than just an infantryman or an artilleryman." (E1)

"Is there a way to put a soft skills translator into this program because the technical stuff is easy, but what you'll find is that a lot of transitioning service members don't stay in the same technical field. And as you get senior like Participant J and Participant L mentioned, it becomes more about the soft skills and leadership skills that we possess." (E2)

LERs should integrate with an evaluation tool or service.

Many post-secondary colleges and universities evaluate the college-level knowledge and skills an individual has gained outside of the classroom for college credit. This evaluation is called credit for prior learning (CPL), but it may also be referred to as prior learning assessment or experiential learning. Many learners and workers shared a need or experience of having to have their skills, experience, and credentials evaluated by a third party or agency to validate that they are of quality and also qualify for CPL. This was also experienced by Spanish-first learners and workers who required a third-party agency to evaluate their foreign credentials for credibility and equivalency. Ensuring the LER data could integrate and/or partner with a translation tool or third-party service would assist learners and workers in being successful during their transition.

"I want an LER to capture and translate tools that can effectively evaluate my ability to integrate nonschool and training and to be able to talk to systems, be able to pull badges and information and validations. So this group down here is evaluation and integration, something like that?" (B2)

6

Principle 6: Adopt a Comprehensive Approach to Digital Credentialing
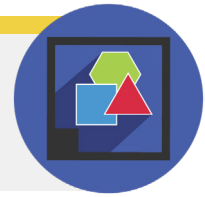
LER technologies should adopt a comprehensive approach to digital credentialing
LER technologies should include the following: • a functionality for the holder to check for credential data accuracy and consent to its inclusion in their LER; • verifiable and unverifiable digital credentials; • institution, peer, and self attested digital credentials; and • a variety of credential types and expressions.

A theme that arose in the development of Inclusive Design Principles for LERs (Cacicio, et al, 2022), was that LERs should provide an opportunity to communicate a variety of skills over time, that are verified in a variety of ways, including by oneself, as part of a dynamic learning journey. This design principle builds on and extends the previous principle by adding the dimensions of data accuracy, consent, and credential expressions.

To uncover how learners and workers use credentials, during the interviews we asked participant-advisors to share examples of how they demonstrate or show evidence of who they are in the world, their character, as well as their skills, work experiences, and their education. Participant-advisors mentioned multiple types of credentials, digital and analog used for multiple reasons. One participant-advisor even commented, "I'm a walking credential!" to indicate that how she shows up physically as herself in interviews and face-to-face conversations was evidence enough of what she brings to a role or project. We also interviewed a builder who shared, "My customers don't care if I have a degree or to see all my [history]. They want to know I am licensed to build in the state, I have a permit for the project, and they want to see photos of my past work. That is all they care about." This led us to conclude that LER records and the technologies which are integrated with them need to adopt a comprehensive approach to what is a credential, how and who issues them, and digital credentialing specifically to ensure it is designed for a variety of learning, work, and life contexts, especially for HSE learners and workers. For the project we grouped credentials into five types based on their use or what they demonstrated: identity, learning or education, earning or employment, movement or travel, and other.

During the discussion on credentials, learners and workers shared their ideas about what credentials should be included in their LER, as well as questions and concerns about where they come from, what data they hold, and who owns or has the ability or authority to issue, share, or edit them. They also shared the importance of being able to check the accuracy and consent to the credentials' inclusion in their LER. From this discussion we codesigned four sub-principles to guide how LER technologies could adopt a comprehensive approach to digital credentials.

LER technologies should include functionality that allows the holder to check credential data accuracy and give consent to its inclusion in their LER.

One common request from participant-advisors across all credential issuer attestation types was no matter who is issuing or attesting to your credentials, the learner or worker (holder) of these credentials and the record to which they are being included should have the ability to check the accuracy of credential before it is added or integrated and also have the functionality to consent to its inclusion in their LER. This would be especially important if on an immutable ledger.

> *"I'd like to be able to check. I'm kind of curious about that because if you got my date of birth wrong, and I can't check it and then I'm kind of curious what that looks like." (A2)*

LER technologies should include verifiable and unverifiable credentials.

One of the reported benefits of digital credentials is their verifiability, that is the quality or state of being capable of being verified, confirmed, or substantiated as true, correct, and from a trusted source (Sedlmeir, Smethurst and Rieger, 2021). One of the promises of LERs is that the record and the credential data in the record is verifiable. Participant-advisors shared that this functionality would support their transitions, while making their skills and experiences visible easily, quickly and affordably.

> *"So I like this one as well because right now I'm working for a company that allows me to earn certificates in different programming languages. And if I'm able to add those certificates to this wallet, I think it'll be easier for me to kind of show my next employer like, 'Hey, I also earned these certificates besides my degree,' my bachelor's, or whatever. So I think this is something also simple to kind of get verified that I did all this work." (C1)*

Participant-advisors also explored situations where they might have credentials that are unverifiable. Such as when an institution or employer no longer exists, you earned the credential a long time ago, or the credential is from a foreign country or in a different language, so there is difficulty in translating the information as well as evaluating its equivalency. Participant-advisors shared that these credentials still deserve to be included in an LER and valued as important, even if they are unverifiable.

> *"I was just thinking about my own experience, and I know of a place [a] community mental health council I worked at, right? They no longer exist, like how can that be verified? How do they connect with so many different places where I don't know?" (E1)*

> *"Lo otro que me hubiese gustado es que me hubiesen dado la oportunidad de demostrarles que no necesitaba ese examen de inglés para poder estudiar en la universidad. Porque creo que ese fue el único momento que I didn't feel good, no me sentía bien. Solo porque mi grado no es de este país, pero yo tengo un montón de formas de demostrarte que yo sé leer, escribir y hablar." // "The other thing I would have liked is that they would have given me the opportunity to show them that I didn't need that English test to be able to study at the university. Because I think that was the only time I didn't feel good, I didn't feel good. Just because my grade is not from this country, but I have a lot of ways to show you that I know how to read, write, and speak." (Participant K)*

LER technologies should include institution, peer or individual, and self attested credentials.

Participant-advisors discussed during the interviews and workshops where their credentials come from and who issues them. In many industry and sector discussions on credentialing, experts often default to the dominant culture, that of "institution as issuer" attestation. Yet, participant-advisors provided examples of three types of issuers for the credentials of most value to them during transitions along their learning and career pathways. These include institution, peer/individual, and self-attested credentials.

> *"I remember one specific feature from LinkedIn where people can submit any recommendation or a proof of some skill that you have that is really informal, but it helps you to get credibility [from] the people you've worked with." (C1)*

> *"There are things that you have to fill out on a resume that are things like availability of work, hybrid work, when can you start, things like that, possibly your citizenship, whatever. I don't know that I've seen those in an LER, but they're definitely things that would be pertinent to a resume or an applicant tracking system." (B2)*

LER technologies should include a variety of credential types and expressions.

Participant-advisors discussed during the interviews and workshops where their credentials come from and who issues them. In many industry and sector discussions on credentialing, experts often default to the dominant culture, that of "institution as issuer" attestation. Yet, participant-advisors provided examples of three types of issuers for the credentials of most value to them during transitions along their learning and career pathways. These include institution, peer/individual, and self-attested credentials.

> *"To apply for the [current] position, you have to have a reference from your last employer [or peer]. Before I left the state of Louisiana, I let my supervisor know. We did everything. I said, "I'm going to be going and I will be applying for the position." She gave me a letter. But then she also sent me an email. Then what I did was, I uploaded the letter that she gave me in the portal because you have to upload recommendations." (Participant E)*

7

Principle 7: Integrate with a Variety of Tools

LERs should integrate with a variety of tools to make the LER data useful for people experiencing transitions
LERs should integrate with the following: • a skill highlight and/or matching tool or engine, • a portfolio or resume builder, • a pathway map or timeline feature, and • other tools

Often LERs are described in the context of data interoperability, as is the case with C-BEN's (Competency-Based Education Network) Interoperability Project (2023). During the workshops, however, learners and workers shared with us a number of tools and technologies they would like their LERs to power or integrate with to support them during transitions. We include the top three here:

LERs should integrate with a skills highlight and/or matching tool.

Throughout discussions participant-advisors shared their experience with skills or experience matching tools they'd seen on job websites or application tools. The purpose of the feature is to read/review the skills or competencies a person has in their record or resume and either a) highlight the hot skills employers are looking for, or skills they will need to develop for the role, or b) match the person's skills with the skills listed in a job description or advertisement. This would save people time and the cognitive load it takes to find good person-to-job skills alignment.

"Highlighting hot skills that you may have so that you look more attractable to employers or that it will draw attention to employers." (A2)

"When I think back to the military tool, the piece where it allows you to put in your skills and it kind of tells you what you align ... so it just kind of shoots out for you: Here are some things that might work for you, and here are some things that could work if you have a little bit more training. ... Having those things would have probably opened up a lot more opportunities." (A1)

LER technologies should integrate with a portfolio or resume builder.

It was unanimous across participant-advisors that with the amount and different types of data and information LER technologies would give them access to, they would need an easy and user-friendly way to best organize and present the information from their LERs to a potential employer or educational institution. In this the LER is not a replacement for a resume, portfolio, or an academic transcript. For learners and workers the LER is the data source that powers a person's resume or portfolio.

> "It would be interesting to have some kind of resume, not just a builder like, right? I think some of these technologies, they're like, It'll export the data out and create a resume for you. What does it look like if you go through and go, okay, it's not just a different resume for a different job. It's also a different resume for a different application for different organizations." (C2)

> "I liked that you put all of this information in, and you can send part of the document, the entire document. I really like that piece. You can pick and choose what you need from the document once it's created." (E1)

> "Crear un portafolio adecuado a diferente tipos de posiciones." // "Create a portfolio suitable for different types of positions." (H2)

LER technologies should integrate with a path or timeline feature.

Learning occurs over time, and it takes time to learn and collect the assets needed to demonstrate to others one's skills, competencies, experiences, and credentials. It also requires access to the tools to document and collect these attestations over time for looking back, as well as projecting forward where one is headed. Time is a very important characteristic of learning and especially transitions along one's pathways. Learners and workers shared in the workshops they would like their LERs to power a timeline or map feature where they can visually see their path of learning over time and from multiple sources.

> "And you can use something to track that path for growing … that you are constantly per-forming and you are doing things well, it could be very valuable." (C2)

> "So having a sense of orientation. It's kind of like your financial planning career path. Yeah. Some direction." (E2)

LER technologies should integrate with other tools which may be of value when experiencing transition.

The three most mentioned "other tools" included HR recruitment and application tracking software (ATS)—so people don't have to enter the data multiple times, professional social networking sites (LinkedIn, Indeed)—so it populates their professional profile, and credential renewal services—so that learners and workers are notified of credential renewal or update information in a timely and affordable manner.

Realizing the Promise of LERs

When designed for learning transitions with people who have been historically and systematically excluded, LERs have the potential to mitigate inequities in enrollment processes and education systems, as well as workplace recruitment, hiring, and promotion practices (Goger et al., 2022). Similarly, LERs may also enable individuals and institutions to move to more skills-based practices in education and workforce decision making, making skills more visible and changing our reliance on two- and four-year degree-based credentials as a proxy for a person's skills, knowledge, and abilities. To achieve these promises, LERs must be grounded in *interoperability, inclusion,* and *usefulness*.

- **Interoperability:** It is critical that LERs are designed for interoperability so that learning and employment systems or software can effectively engage, exchange, and make use of learner and worker data and information across systems (Garrison Duncan, 2023; Goger et al., 2022).

- **Inclusion:** It is important that learners and workers are included at the design table so we can ensure LERs include what they need, are easy to use, are accessible, and data is private and safe, especially for our most marginalized of communities, and designed with learner and worker control over the use of their data and information (Cacicio et al., 2022).

- **Usefulness:** Lastly, and the core insight from this report, LERs need to be codesigned with learners and workers from HSE communities so that they are of use and value to them while they are experiencing learning transitions across multiple pathways.

How easy a technology is to use, as well as how accessible it is for users with limited digital skills, is critically important for people from marginalized communities to realize the benefits of a learning and employment innovation (Goger et al., 2022). So too is the innovations' perceived value to their lives and the organizations who serve them. Since the 1980s, technology adoption and use studies have concluded that people will only adopt and consistently use a technology that they perceive as of use and value to them, be it in their learning, work, or everyday lives. Perceived usefulness is the subjective perception that a person believes that using certain technologies can improve their learning, work, or performance in some way (Davis, 1986, Page-Thomas, 2007). It is a driver of technology acceptance, adoption, intention to use, as well as the perceived satisfaction from using a technology.

Learners and workers want more agency over their records and what they can do with them, what they can power, integrate with and be used for—along their education, career, and life pathways. In short, "How does it help me to get a better job or get paid more?"

With rising support for skills-based hiring in the education and workforce ecosystem, there is a unique opportunity to influence the design of LERs to transform pathways to economic security.

However, scalability will be threatened if designs do not embed the inclusive perspectives of, and solve tangible problems for, learners and workers.

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Appendix A: Learning Transition Stories

A: Losing my bar job during COVID and transitioning into freelance digital work (Participant A)

"I became unemployed, lost my job during COVID. That was four years ago. So before that time, I was just working in a bar. I lost my job. So we're all in the house. A friend of mine introduced me to digital work. So he started sending me some things and took me on some tutorials and other learning and developing other skills. So that's how I started with this passion because I got to see that is something I can do in my spare time, something I had a way to be really accessible to others to make ends meet. Where I am today and I'm doing well for myself."

"The major challenge that I have is as a Black man, I have less access to some money, funding, and some loans that could boost what I may want to do. So because I've accepted the challenge, then I work hard to make sure I could provide myself with the basic things. I have some courses, and things are expensive, but that's I'd say for now I just have a—you get access to a couple of them, but I'm just saving up to get them to boost my skills."

"In my experience, I have difficulty in learning, and at school I would really try to be a good student at what I was doing. I just made up my mind and to really give my time and I started learning, but I made a lot of mistakes because I was at my early stage. But I never allowed that to weigh me down. So I just needed to push. And where I am today, I would say I'm good at what I'm doing right now. So the experiences from the ups and downs to attempt attaining a level of perfection."

"I had a friend that I saw as a mentor. It's easier if you have a mentor in whatever career you're looking out for. It's easier with a mentor. So for me, I will send videos to my mentor. He's my friend and he helped me get through them and get to where I am today.

"The transition process was all about being focused, being disciplined, setting your goals. I would say it's all about your mindset. Be prepared and develop passion because one's passion makes it possible. And you must see challenges as challenges worth taking."

B: Transitioning from working in the school system to administration and DEI work in corporate (Participant B)

"I have worked in the school system for the past four years, and I just recently made a transition out of the school system. Now I do administration on a corporate level. I'm currently transitioning from kind of like an office administration role to HR, where I'm doing a lot of work with DEI as well. I wasn't really aiming to go outside of the school system. I was looking for a position or an opportunity where I could be more of myself, and I was prepared for making a change if necessary."

"I think the thing that helped me with my progressive interest in DEI is just life experiences and just seeing the need for more diversity and equity. And then my transition has also been about just finding what feels right for me, I think. So just wanting to kind of create this idea of life as I see it is what pushes me to continue to do what I'm doing."

"I was very open to going into another school, but this opportunity came up, and this is a great organization. I think that in conversation with my CEO and just kind of explaining why DEI is important to me, prove to him that he could trust me to lead the charge on that. And it was a matter of just kind of sharing a lot of what I've told you, just my journey, my experience growing up, my

"In transitioning from one job to another. I think there's always an opportunity for me to sell myself because like I told you on paper, I feel like it doesn't give people an accurate idea of who I am and the kind of work that I'm capable of doing. And, of course, when people see that I don't have a degree, they're instantly skeptical. So I think being able to sell myself or advocate for myself is a way of proving to people that I'm more than what you see on paper."

"So firstly, the fact that I don't have a degree. I think when most people look at a resume for the types of jobs that I have had, they are instantly looking to see when did you get your degree? Where did you get your degree from? And I think that I've missed out on a lot of opportunities because when people look for that and they don't see it, they just move on to the next resume. They're looking for the person with the degree mostly."

"I think about the job titles that I've had, especially in education in the school system. I feel my job titles have never been a good indicator of what I actually do. I've always felt like the office manager was my role, and they think of the lady that sits at the front desk and answers the phone and takes the mail and gets the deliveries and things like that. The things that people don't see are … the things that not, that I couldn't put in a resume."

| experience in being employed. So I definitely feel like that was a way of proving to him that he could trust me to do it." | "I've always said, If people give me an opportunity, if you see my resume and you say, 'I'm going to call her for whatever reason,' usually people are pleasantly surprised, and they didn't expect to get what they get from me." |

C: Obtener la validación de mis credenciales de aprendizaje de Cuba / Obtaining validation of my learning credentials from Cuba in the United States (Participant C)

"Además de la transición típica, y de todo lo que conlleva cambiar de trabajo o empezar a cursar estudios superiores, el factor cultural complejiza la transición para aquellos que venimos con credenciales extranjeras. La homologación de credenciales foráneas es un proceso complejo. Hasta donde sé, hay seis agencias en los Estados Unidos que están calificadas o certificadas para homologar títulos del extranjero. De la manera en que está diseñado el proceso, estas agencias requieren la presentación de títulos y certificación de estudios terminados originales cada vez que se inicia el proceso. Por ejemplo, si un individuo con una Licenciatura inicia un proceso para estudiar una maestría, debe presentar (en persona) sus credenciales originales a una de estas agencias, pagar los costos correspondientes, y esperar el tiempo establecido que puede ser de 2 a 4 semanas. Si esta misma persona va a empezar un Doctorado, debe hacer lo mismo porque las universidades archivan las evaluaciones originales, y suponiendo que las devuelvan, ya han sido sacadas del sobre original y por tanto, ya han perdido su carácter 'oficial'." *"In addition to the typical transition, and everything that goes with changing jobs or pursuing higher education, the cultural factor makes the transition more complex for those of us who come with foreign credentials. The approval of foreign credentials is a complex process. As far as I know, there are six agencies in the United States that are qualified or certified to homologate titles of the foreign. The way the process is designed, these agencies require the presentation of titles and certification of original completed studies each time the process needs to be started. For example, if an individual with a bachelor's degree starts a process to study a master's degree, you must present (in person) your original credentials to one of these agencies, pay the corresponding costs, and wait for the established time that can be from two to four weeks. If this same person plans to also pursue a Ph.D., they should do the same because universities file the original evaluations, and assuming they return them, they have already been taken out of the original envelope, and therefore, they have already lost their 'official' character."*	*"Otra vez, lo más complejo de la transición es reglamentar la documentación. Yo vengo de Cuba. Yo me traje de Cuba mi diploma de Licenciada y certificación de estudios terminados. El proceso consiste en presentar los documentos originales en a Josef Silny & Associates, los que viven en el sur de la Florida. Josef Silny tiene sus propios traductores. Las credenciales son traducidas primero, y luego homologadas según lo más cercano que exista en los Estados Unidos. Por ejemplo, en Cuba la Licenciatura en Educación se cursa en 5 años, y esto hace que exceda en cantidad de créditos a los requeridos en los Estados Unidos para esta misma carrera, lo cual me situó a medio camino entre un Bachelor y un Máster."* *"Again, the most complex part of the transition is regulating the documentation. I come from Cuba. I brought from Cuba my graduate diploma and certificate of finished studies. The process consists of presenting the original documents to Josef Silny & Associates, who are in South Florida. Josef Silny has their own translators. The credentials are translated first and then approved according to the closest that exists in the United States. For example, in Cuba, the Bachelor of Education is completed in five years, and this means that it exceeds the number of credits to those required in the United States for this same career, which placed me halfway between a bachelor and a master."* *"Hubo una clase que tomé en Miami Dade College, cuyo nombre no recuerdo, que fue de gran ayuda en mi transición. Sé que tienen un programa llamado REVEST que incluye información sobre la gestión académica y laboral: preparación de resume, información sobre agencias que homologan credenciales extranjeras, etc. Y este tipo de programas son de gran ayuda para introducir a los inmigrantes a la vida académica en los Estados Unidos. Recuerdo que en esa clase me explicaron qué pasos debería seguir. Ayuda mucho que nos expliquen cuál es el camino. Desde entonces me ha llamado mucha gente que no saben qué hacer o a dónde dirigirse con sus credenciales. El que no sepa cuál es el camino a seguir, está perdido aunque tenga credenciales oficialmente válidas. Estoy segura de que la comunidad hispana valoraría mucho una educación apropiada en los procesos de inserción académica y laboral."*

"Yo estuve 15 años exactos trabajando con una misma compañía. Cuando comencé en mi empleo actual, y como parte del proceso de inicio (onboarding), debía mandar una evaluación original de mis credenciales a Recursos Humanos. Entonces llamé a la agencia asumiendo que aún estaría en la database, en cuyo caso podían expedirme la misma evaluación que ya tenía hecha. Pero como no era el caso porque ya habían pasado 13 ó 14 años desde la última vez, me tocó hacer el proceso de nuevo: llevar mis papeles originales a Josef Silny & Associates, en Miami, esperar por la evaluación, etc. O sea, hacer exactamente lo mismo que hice cuando llegué de Cuba. No tuve otra alternativa porque no tenía una evaluación oficial o en sobre sellado."

"I spent exactly 15 years working with the same company. When I started at my current job, and as part of the onboarding process, I had to submit an original evaluation of my credentials to Human Resources. So I called the agency, assuming it would still be in the database, in which case they could send me the same evaluation that I had already done. But it was not the case because 13 or 14 years had passed since the last time. I had to do the process again: take my original papers to Josef Silny & Associates, in Miami, wait for the evaluation, etc. In other words, do exactly the same thing that I did when I arrived from Cuba. I had no choice because I did not have an official evaluation or in a sealed envelope."

"There was a class I took at Miami Dade College, whose name I don't remember, that was a great help in my transition. I know they have a program called REVEST, which includes information on academic and labor management: resume preparation, information about agencies that approve foreign credentials, etc., and this type of programs are of great help in introducing immigrants to academic life in the United States. I remember that in that class they explained to me what steps you should follow. It helps a lot that they explain the way to us. So many people have called me who don't know what to do or where to go with your credentials. He who does not know which way to go is lost, even if you have officially valid credentials. I am sure that the Hispanic community would highly value an appropriate education in the insertion processes academic and work."

D: Immigrating from Mexico and transitioning from a student and hospital-volunteer to a nurse (Participant D)

"When I went from a student to a nurse and coming from Mexico to over here, that was a really big transition. There was a change for me since I only speak Spanish in 2013. And then I came here to high school, where I didn't know any English, and then I had all these classes that were in English, and I didn't even know what they meant, the words, the teachers, the students. I don't know what they were saying. It was really hard."

"When I came from Mexico, I thought that was for the better. We have a better education over here in the USA. There are more opportunities. And it's a better life. You work for it. And you get what you deserve when you're working for it. The same thing with nursing, whenever I was a student, I went into the question. Now that I'm working, it's for a better future, something I chose for a better future for me and for my future family."

"Then I had to have all my vaccinations, and I had some from Mexico, and they wouldn't accept those. There were a lot of things that were required from me that I didn't have. That's why it took me so long."

[A challenge] "I think mostly it's financially I would say since I was in school and I couldn't really work and my husband was the one working. He had a lot on his back since he was supporting me for two years. And then with school too. I also think that because I'm from Mexico, my primary language is Spanish. So I have a challenge with English."

"With the transition to being a student nurse is to nurse, I think it helped me a lot to have an experience. I would always volunteer at the hospitals. And then the clinical experience from school will go to different hospitals, different nursing homes. But whenever I change into an RN or an LVN, I already have the experience. I really knew more or less all the work will be, a day in the work will be."

"Whenever I was going to the school, I had to do some prerequisites, and I needed to be—I think, the most. The problem that I experienced was that I needed to be from over here. I needed to have a residence, and I wanted to go into nursing school so I couldn't go into international school without being from here. So that was a problem that I experienced, a challenge that I had."

[Advice for others] "I will say do everything they can to not give up because it's going to be hard. And it's going to take time. But it's going to be worth it in the end. It doesn't matter if you're having a bad day, something happens. You have to quit for a few months. It doesn't matter if you go back. You have to finish your goal and to earn it because it's worth it. It's whatever the future holds for better education and better opportunities."

E: Transitioning from living in Louisiana to Tennessee and finding work in a school in a new state (Participant E)

"Originally, I'm from New Orleans. Currently, I live in the state of Tennessee. So the one transition that I did have when I moved here, I got a job, yet it wasn't in education at first. I was working at Olive Garden as a waitress while I waited as I knew I have the credentials to work at the school. Yet they weren't hiring at the time. I still put in my application and I waited and I waited."

"In the meantime, I worked at Olive Garden. I just walked into Olive Garden one day and said, "Hey, I'm looking for a little part-time job." They hired me on the spot. It kind of pushed me to do what it is I wanted to do."

"My first 10 years in education I worked with K-5 and with autistic students. Then the second 10, I worked with K-5, but they were PE kids, the kids that everybody, all the teachers had from K-5. And then, for the last 10 years, it was high school. So I worked with elementary, and then instead of middle, I went straight to high school with behavior and autism."

"Well, they [the school in Tennessee] called me to drive a bus. I can barely drive my Fiat. So I know I don't want to drive a bus. But if it was to get my foot in the door to get back to where I wanted to be, then that's what I had to do. Ultimately, somebody else called me, and I was able to go right on in, and it was only about three weeks before I was able to transition into a position."

"I took a leap of faith, and I became a student coordinator. I now work in adult education, and I help adults and some young individuals. I helped them get theirs—it's not so much a GED anymore, but I helped them get their high school equiva-lency diploma."

"I myself did not finish high school. I had a child, and instead of going back to school, I did other things. When I was doing other jobs, it was like I saw it as being a dead end for me. I didn't want to be struggling and trying to just do whatever, so when my kids were little, I went back to school and I got my GED because I wanted my child to see that you don't have to limit yourself. I got my GED, and then I started taking classes. I would go to work and I would go to school. Then the school job became available, so I took that opportunity, and I started taking online classes to become a teacher, but it was a hard journey because trying to go to school and work a full-time job. I was able to leave the [last] school with an associate's degree."

"So what led to the transition? I went through a divorce. My kids I waited 'til they all were of age and grown and everybody was out of the house, so then I went through a divorce. And to make the divorce easier for me and not so hectic, I had to just bide my time and wait."

"I moved to Tennessee, which is still in the south, kind of close to where my family lives, but not in the state of Louisiana. I needed to be out of Louisiana. The power of prayer helped me! I was crying. But prayer helped me. And just moving out just getting out like I said."

"To apply for the [current] position, you have to have a reference from your last employer. Before I left the state of Louisiana, I let my supervisor know. We did everything. I said, "I'm going to be going and I will be applying for the position." She gave me a letter. But then she also sent me an email. Then what I did was, I uploaded the letter that she gave me in the portal because you have to upload recommendations. And then you have to give them some references of people that they need to be able to call to verify that this is what it is about you and the kind of work ethic that you have."

"I also had to be certified by the state, which I was certified in the state of Louisiana. So my credential follows me wherever I go, any state I go to. So I had that in my identification and fingerprints, stuff like that."

F: Retiring from the Marine Corps after 26 years and transitioning into the civilian workforce (Participant F)

I got really high and served as a colonel in the United States Marine Corps. I had an amazing career over 26 years. I retired as a colonel in the United States Marine Corps. That's behind me now. That part I won't say is dead. But I am no longer that person. So how do I transform and transition now?"

"I effectively retired in December. I received my VA disability benefit rating, which is one of the most important steps for veterans."

"The military wants you to start preparing 18 to 24 months out. I started the military formal transition when they send you through training on how to properly get out, get a civilian job. So all of that stuff has ended. Now it's kind of on me. And I'm getting ready to start March 3rd.

"I went into a [Transition Assistance Program] course, and I've heard a lot of people say that they didn't even continue with the course because they just didn't enjoy it. There are a lot of guys with the same rank as me. They were like, "Yeah, that's what you think you're going to do. That's the great easy transition," but the minute they did it, they hated it."

"I had a successful, three-month fellowship at a global consulting firm, but because of the economy, the way the company I was working at for the fellowship, they weren't able to bring me on, even though I did really well. They put me on the waiting list. So I'm patiently looking."

"The experience I'm having now is, I don't want to say anxiety, but a little bit of worry because I'm within six months now. And a matter of being able to build resumes with yeah, you receive training, but once you sit down and you start doing it, it's a little different than our evaluation reports. Our challenge is learning civilian lingo, which is different from ours. Being able to talk to people and translate things in a way that they understand that we've done over, being able to correlate our jobs to a civilian sector."

"For me, my biggest challenge is getting this resume done. But the problem with the resumes too is the world wants a resume tailored to the job versus you just telling them how great you are. And they figure out if they want to use you or not. And then not knowing what job you want, it's hard to write a resume when you don't even know what the job consists of, so ..."

"What I did is with that end goal in mind, I've created a plan. I have about five different buckets. Each bucket represents a different career path option. And I was told by several mentors, 'Hey, be prepared to not work for six to 12 months.' I was like, 'Damn, really?' And they're like, 'Yeah,' they're like, 'if you rush into something, it's going to be like walking into an ambush. You're going to get slaughtered. We recommend resetting distance, patiently waiting, and then when you find the right opportunity, then you pursue it.'"

"I would say speaking with vets who have gone through it before is arguably the most important factor helping set someone up for success for transition from the military."

G: Transitioning from the Army at three years for college and again after 28 years to work in DEI for a biotech organization (Participant G)

"I'd say retiring from the Army after almost 28 years and going into biotech [via] Hiring Our Heroes fellowship program. Specifically, during the fellowship, I worked with the company's diversity, inclusion, and belonging team. And from just doing a good job during the fellowship and networking, networking a lot, built up a good reputation within the organization."

"When I started to apply for specific roles, the roles I actually applied for I didn't get hired for. Everyone with this particular company went to an internal hire. I met a very dynamic executive director who said, 'Listen, we know you have a whole bunch of skills. We know you're good at a lot of things, so what I would like to do is give you a position, give you a title, but not a role. I'm going to let you do this rotational program, and at the end of your 36 months, doing these three different rotations,

"Yet, this is my second transition. I was in the Army for three years, and I got out to go to college. When I got out and it was 1996, the agencies that exist now were nonexistent. The level of support that service members got to transition back then is totally totally different from what it is now."

"I think what helped me honestly is because I had transitioned so long ago that I remember that experience as a young 21 and how terrible that experience was and literally was like, 'Oh, what are you going to do when you get out?' I was like, 'I'm going to go to college.' They were like, 'Okay. Well, you'll need to learn how to write a resume. You know how to fill out an employment application?' And I was like, 'Yeah. But I want to kind of sort of get a job.' And they were like, 'All right. Well, use your G.I. Bill, get a job, or get unemployment, and you'll be okay.' That was my transition at that point."

you tell me where your passion is and then that's what you'll work for.' She took a real people-first approach and allowed me to do the things that I'm passionate about, that I think my skills are suited to." *"I would say, honestly, transitioning out of the military, landing with the company that I'm with now, has been more of a success story for me than it is for a lot of people. Everybody's story is a little bit different. Some people are on a shorter time. Some people might be medically discharged. Some people may be dishonorably discharged. So it's different for each person, but at the end of the day, the resources are still there for people to take advantage of and use."*	*"This time around, I knew that it was going to be my responsibility to take more control of my transition. At that age, I thought everything was just going to—'Oh, the Army is going to do it for me.' And that just wasn't— that [laughter] wasn't the case."* *[What helped] "Mentors. Reaching out to people who went through the process before. Asking them what worked for them, what didn't work for them. And for me, having a really detailed plan of what I wanted to do and where I wanted to go when I started my transition process. So a lot of that just starts, like I said, talking to other people and researching the agencies that were available to me. Sometimes it can be information overload because you got all these agencies."*

Source: LER Learning Transitions Project (January, 2023) Interview total, n=31, stories featured, n=7.

Appendix B: Partner Profiles

Partner	Profile	Technology Partner	Recruitment Partner
RGV Focus rgvfocus.org	RGV FOCUS supported this project as a participant-advisor recruitment partner. RGV FOCUS is a collective impact initiative created in collaboration with Educate Texas and Communities Foundation of Texas. Founded in 2012, the mission of RGV FOCUS is to transform college readiness, access, and success in the four counties of the Rio Grande Valley of South Texas. The RGV FOCUS vision is that all RGV learners will achieve a degree or credential that leads to a meaningful career and a successful life. RGV FOCUS will achieve this by strengthening each step of the educational pathway, better connecting the education system, and aligning community resources to provide the support learners need to succeed throughout high school, postsecondary, and beyond.		x
Palm Beach State palmbeachstate.edu	Palm Beach State College supported this project as a participant-advisor recruitment partner. Palm Beach State College was established to serve the educational needs of local residents striving to overcome the economic challenges of the Great Depression. Today it is an economic engine, pumping $1.1 billion into the Palm Beach County economy each year, according to a 2013 study by Economic Modeling Specialists International. At Palm Beach State College, student success is our first priority. While embracing change and new challenges, the College remains focused on providing Palm Beach County with that crucial "open door" to education and the rewards that come with it.		x

Motlow State Community College mscc.edu	Motlow State Community College supported this project as a participant-advisor recruitment partner. Motlow State Community College is an open access and accessible postsecondary institution. We provide access to general education and cutting-edge learning and training. We support the advancement and development of a broad and divergent group of learners and earners in a growing technologically advanced environment focused on skill attainment. In conjunction with the Learning Economy Foundation (LEF), Motlow State Community College has partnered to create an ecosystem that includes the LearnCard and Metaversity commingling. LearnCard identifies the skills along with micro, short-term, and traditional credentials employers are looking for. Providing a tangible place for the autonomy of the learner to share, display, and utilize when seeking employment.		**x**
RANDA Solutions randasolutions.com	RANDA Solutions supported this research by recruiting participant-advisors and showcasing Teacher Wallet in participant-advisor workshops. Twenty years ago, RANDA Solutions opened headquarters in Nashville, Tennessee and became one of the first pioneers in education technology. We enable education agencies across the nation to address their challenges using powerful and comprehensive online platforms. RANDA serves over 2.4 million active users and is the system of record for over 3.3 million professional educator credentials. RANDA Solutions impacts the efficiency of processes, drives professional growth, and provides actionable business intelligence.	**x**	**x**
Solutions for Information Design (SOLID) solidinfodesign.com	SOLID supported this research by recruiting participant-advisors and showcasing MilGears in participant-advisor workshops. Established in 2003, SOLID is a woman-owned small business establishing innovative workforce development solutions to meet the evolving needs of an ever-changing talent marketplace. Data-driven strategies are used to assess workforce needs with a focus on skills identification and skills gaps to support development of talent management tools to increase recognition of skills and abilities, expand equitable career pathways for the military-connected community, and strengthen our nation's workforce. Our clients include numerous federal and state government agencies, as well as the private sector, non-profit organizations, and foundations.	**x**	**x**

Velocity Network Foundation velocitynetwork.foundation	Velocity Network Foundation® supported this research by recruiting participant-advisors and showcasing Velocity Career Labs in participant-advisor workshops. Velocity Network Foundation® is a nonprofit membership organization, hosting the leading workforce-tech and ed-tech vendors and solution providers. Through its members, Velocity provides the technology and governance for a fully decentralized data utility layer for the global labor market. In doing so, Velocity is reinventing how career records (education, employment, and related individual data) are shared globally. Velocity's utility layer and technology enable full interoperability, empowering individuals, businesses, and educational institutions to interact on an infrastructure that is public, open, trusted, and self-sovereign. Velocity's members contribute to governance of the infrastructure, ensuring that regulations, equitable practices, and related attributes are upheld.		X
Learning Economy Foundation learningeconomy.io	Learning Economy Foundation supported this research by showcasing LearnCard in participant-advisor workshops. Learning Economy Foundation translates leading-edge technologies into transformative learning and economic systems that promote equity, mobility, privacy, and individual agency to radically improve lives throughout the world. We are interested in re-centering recognition and opportunity to the individual learner and worker to achieve their goals. LERs are key data points, enabling learners and workers to carry comprehensive records of their achievements and skills to formulate and convey their unique story.	X	

Appendix C: LER Technology Reflections

Perceived Challenges

Top 15 Perceived Challenges of Using LERs to Support Transitions

Accuracy & Completeness of Information	Safety & Security of Information	Knowing How to Use the LER	Employer Use of LERs	Access or Losing Access to LER
Digital Skills Needed to Use	Awareness of LERs	Verification of Data/Information	Representation of Different Skills	Privacy of Information
Memory of All the Information	Language Translation	Value of an LER	Organization of Information	Future Use or Sustainability of LERs

Source: LER Learning Transitions Project (January, 2023) Interviews (n=31) and Workshops (n=27-28).

Perceived Opportunities

Top 15 Perceived Opportunities of Using LERs to Support Transitions

Everything in One Place	Matchmaking	Convenience	Auto-Translates	Career Search
Visibility	Saves Time	Simplicity	Instant Updates	History
Organization	Verification	Access	Belonging	Ease of Sharing

Source: LER Learning Transitions Project (January, 2023) Interviews (n=31) and Workshops (n=27-28).

LER Wishlist

Top 31 Wishlist for LERs to Support Transitions

Security and Privacy of Data and Information	Matchmaking People to Opportunities	Resources, Guides, Articles	Verification and/or Validation of Data and Information
All Work and Learning Data in One Place	Connect to People	Job Leads	Opportunities
Resume Creator, Builder, Sample Resumes	User Friendly	Organization of Data and Information	Integrations with other Services and Apps
Language Translation	1 LER Standard	Sharing Features	Skills and Experience Translator
Accessible for Everyone	Checklist / Lists	Cultural Learning	Easy to Use
Work and Experience Portfolios	Simple Design	Support Services	Transition Supports
Achievements	All Credentials (Verified and Unverified)	Assessment Archive	Asset Management Features
Pathway History	Document Storage	Recommendation Engine	

Source: LER Learning Transitions Project (January, 2023) Interviews (n=31) and Workshops (n=27-28).

Types of Credential Used During Transitions

State, student, employer, or membership identity cards	Vehicle license, such as car, truck, pilot, and other travel licenses	Passport or travel documents	Citizenship, immigration visas, or resident cards	Birth, parent, or guardianship documentation
Degrees	Certifications	Licenses	Permits	Applications
Badges and/or micro-credentials	Training and testing reports	Recommendation letters	References	Background checks
Performance evaluations	Photos and videos	Health insurance	Other Insurances such as property or travel	Vaccine documentation

Source: LER Learning Transitions Project (January, 2023) Interviews (n=31) and Workshops (n=27-28).

Tools LERs Should Integrate With

HR recruitment and application tracking software	Professional social networking sites	Credential renewal service notifications	New employee or student onboarding tools	Skills and experience documentation tool
Checklists	Chat service	Payment method	Location-based search engine	Background check services
Health record applications	Health insurance and benefit apps	Camera	Credential translation tools or services	Credential evaluation tools or services

Source: LER Learning Transitions Project (January, 2023) Interviews (n=31) and Workshops (n=27-28)