

(MICRO) CREDENTIALS

Old and New Ways of Communicating Skills, Competencies,
Achievements, and Abilities

J. Philipp Schmidt

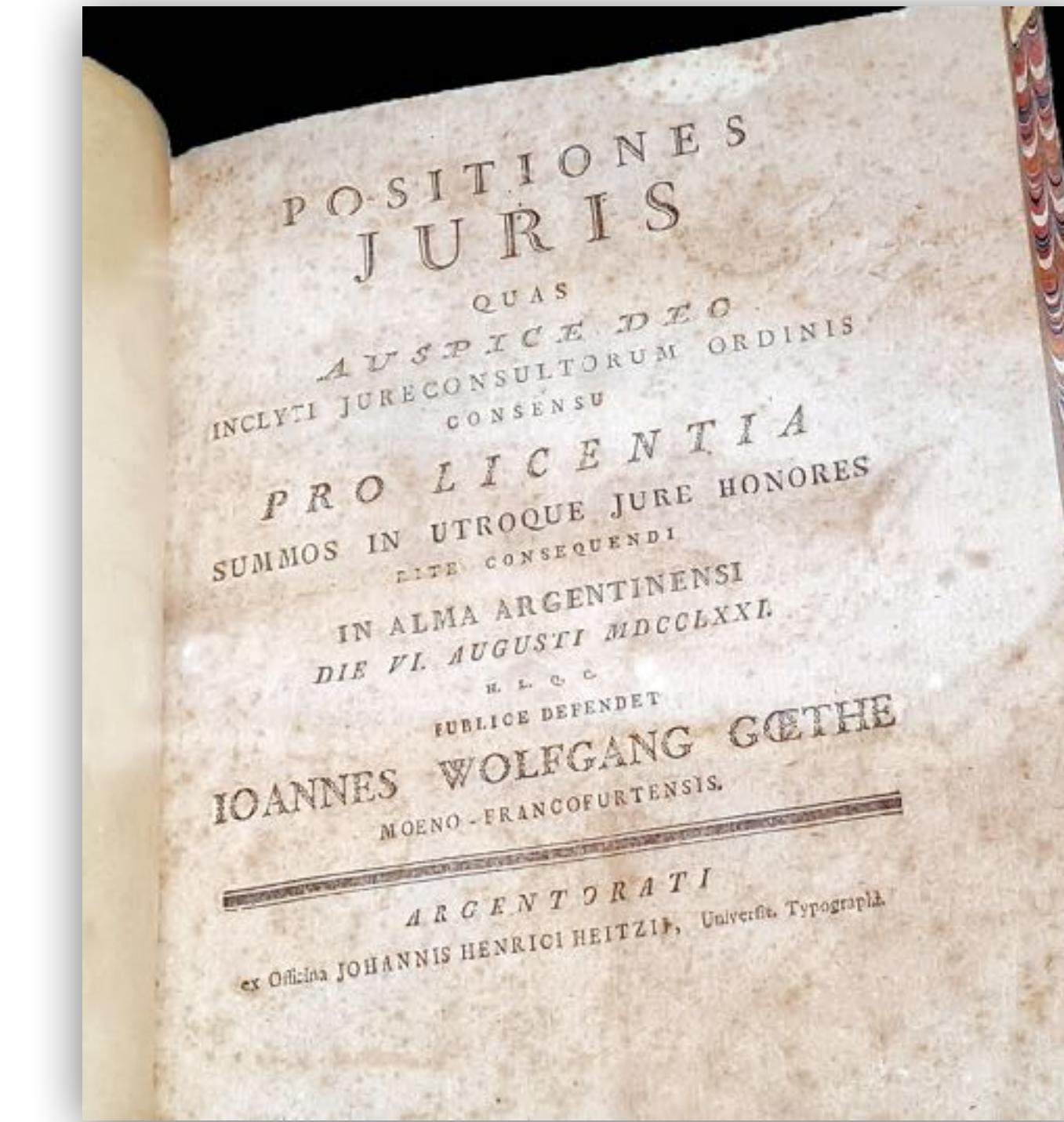
September 13th, 2023

ASPIRATION

**The trail of our achievements and corresponding credentials
speaks to who we are and what we are able to do, and it
opens pathways towards who we want to become.**

HISTORICAL EXAMPLES FOR DESIGNING CREDENTIAL SYSTEMS

LICENTIA DOCENDI



APPRENTICESHIPS



"WANDERBUCH"



US AIR FORCE AIRMEN'S COIN



HIGHER EDUCATION

 Massachusetts Institute of Technology Academic Transcript	Registrar's Office 77 Massachusetts Avenue Cambridge, Massachusetts 02139-4307
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[REDACTED] MIT ID: [REDACTED]	***** 28-MAY-2020 Awarded the Degree of Master of Business Administration ***** Admitted as a Regular Student for Fall Term 2018-2019 ***** Completed Programs: Management - EMBA (Course 15 E2)/Master's ***** Subject Subject Name Lvl Cred Grade ----- FALL TERM 2018-2019 COURSE: 15 E GRADUATE STUDENT 15.700 Exec Mod: Ldrship & Integ Ngmt G 9 P 15.717 Organizational Processes G 9 A 15.722 Applied Econ for Managers G 9 B * * * JANUARY TERM 2018-2019 COURSE: 15 E GRADUATE STUDENT 15.556 Special Seminar in Management G 3 P * * * SPRING TERM 2018-2019 COURSE: 15 E GRADUATE STUDENT 15.701 Innov-Driven Entrep Advantage G 12 A 15.714 Competitive Strategy G 9 B 15.720 Financial Accounting G 9 A 15.730 Data, Models, and Decisions G 9 A * * * SUMMER TERM 2019 COURSE: 15 E2 GRADUATE STUDENT 15.716 Leading Organizations G 9 P 15.734 Intro Operations Management G 9 A 15.736 Intro to System Dynamics G 9 A * * * FALL TERM 2019-2020 COURSE: 15 E2 GRADUATE STUDENT 15.702 Leading in a Global Context G 12 A 15.705 Organizations Lab G 12 A 15.724 Financial Management G 9 A 15.732 Marketing Management G 9 B * * * JANUARY TERM 2019-2020 COURSE: 15 E2 GRADUATE STUDENT 15.718 Intro to Disciplined Entreprene G 3 P 15.721 Comm & Persuasion Through Data G 3 P * * * SPRING TERM 2019-2020 COURSE: 15 E2 GRADUATE STUDENT Semester significantly disrupted starting 3/13/2020 due to Coronavirus COVID-19 outbreak. Mandatory Alternate Grades in effect. 15.703 Leading with Impact G 9 PE 15.704 IDEA Lab G 15 PE 15.707 Global Strategy G 6 A 15.727 The Analytics Edge G 9 PE 15.755 Analytics Proseminar G 3 PE * * *
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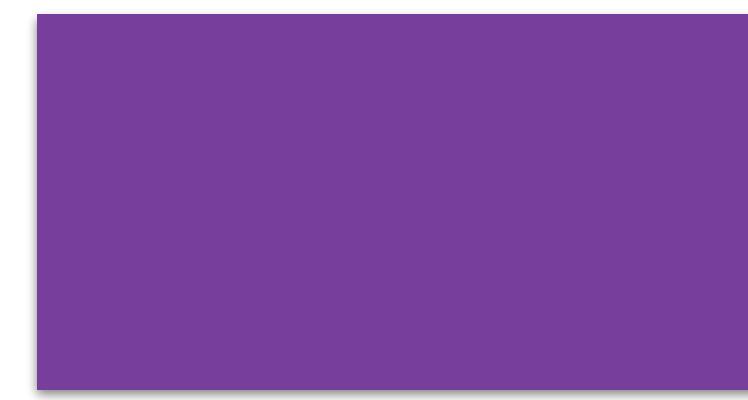
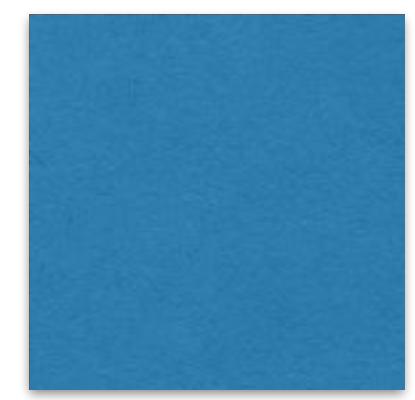


Unofficial without signature
 Brian E. Canavan, Registrar

Brian E. Canavan

To confirm authenticity, see reverse side. Information must not be disclosed
 to other parties without prior written consent of the student.

THE SHIFTING LANDSCAPE OF HIGHER EDUCATION

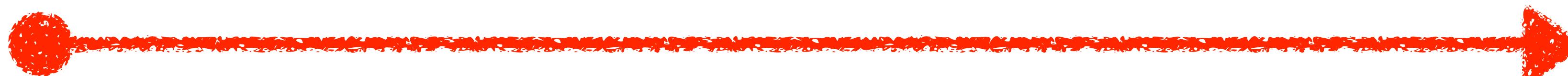


Play

Education

Work

Leisure



Play

Education

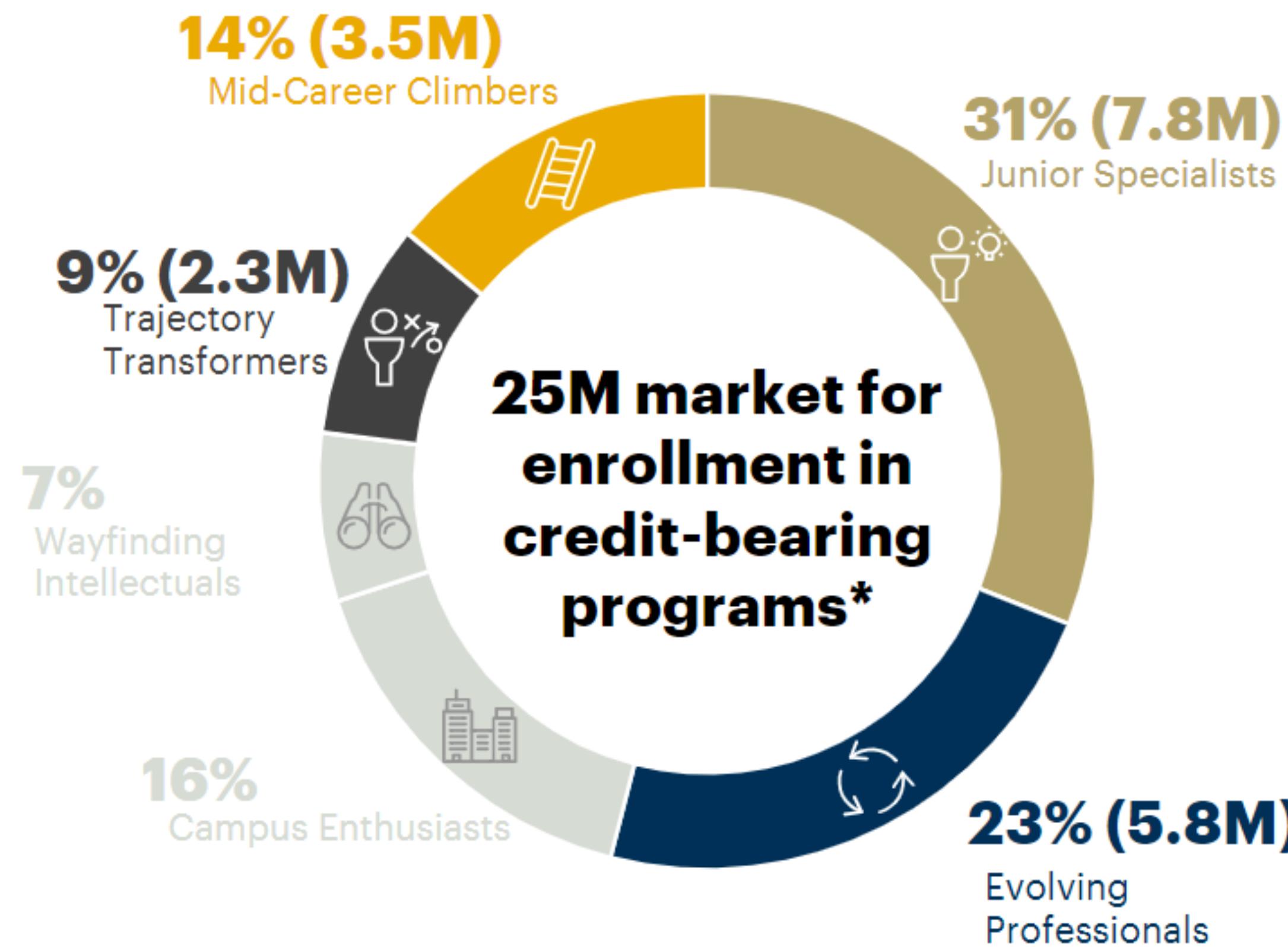
Work

Leisure

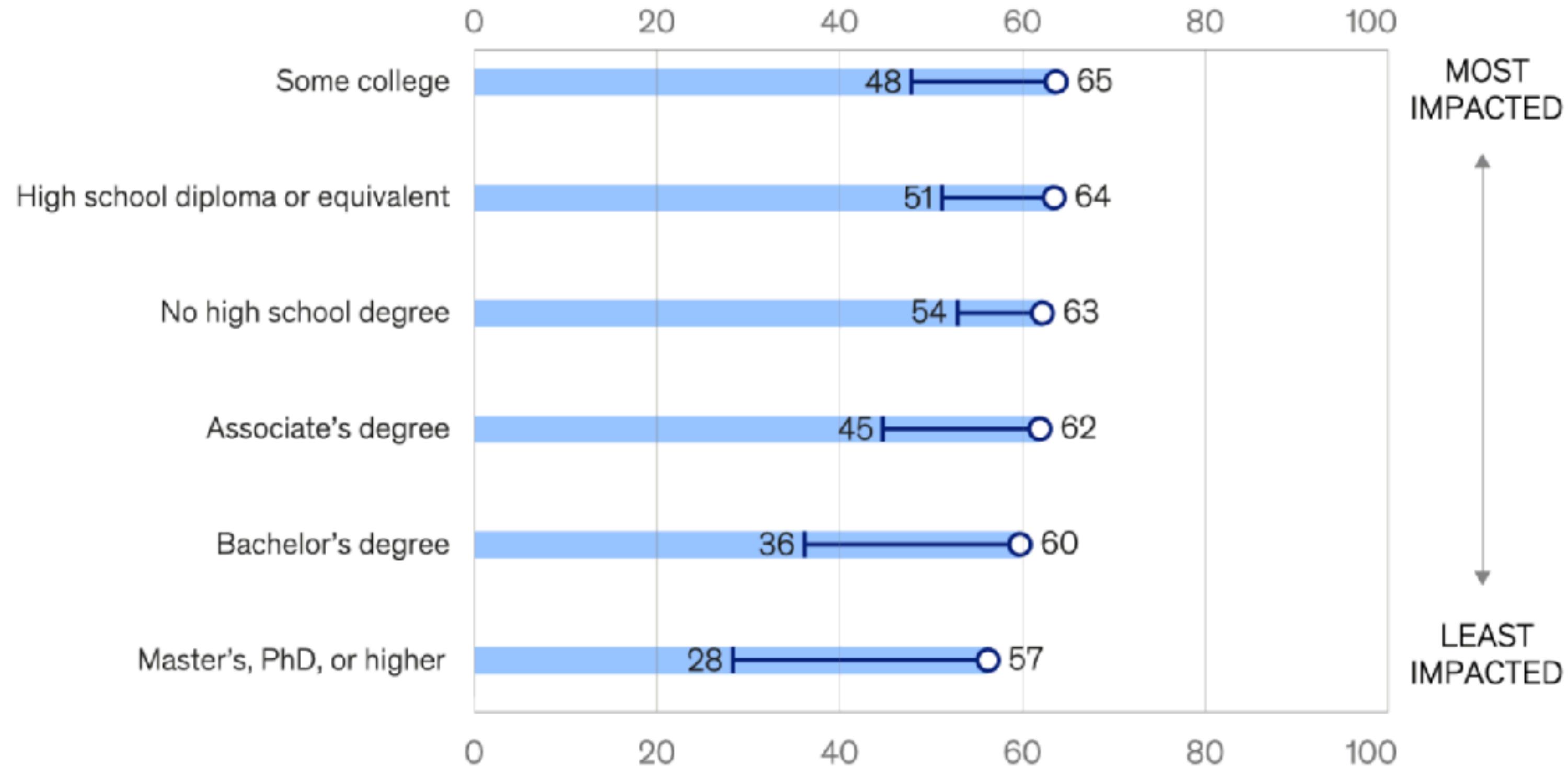


DEMAND FOR A RANGE OF CREDENTIALS

**There are six mindset-based segments of learners;
four of the six can be considered “lifetime learners”**



ADD AI



(McKinsey & Company)

DIGITAL (MICRO)CREDENTIALS LEARNING & EMPLOYMENT RECORDS (LERs)

**LEARNING AND
EMPLOYMENT RECORDS**
LERs

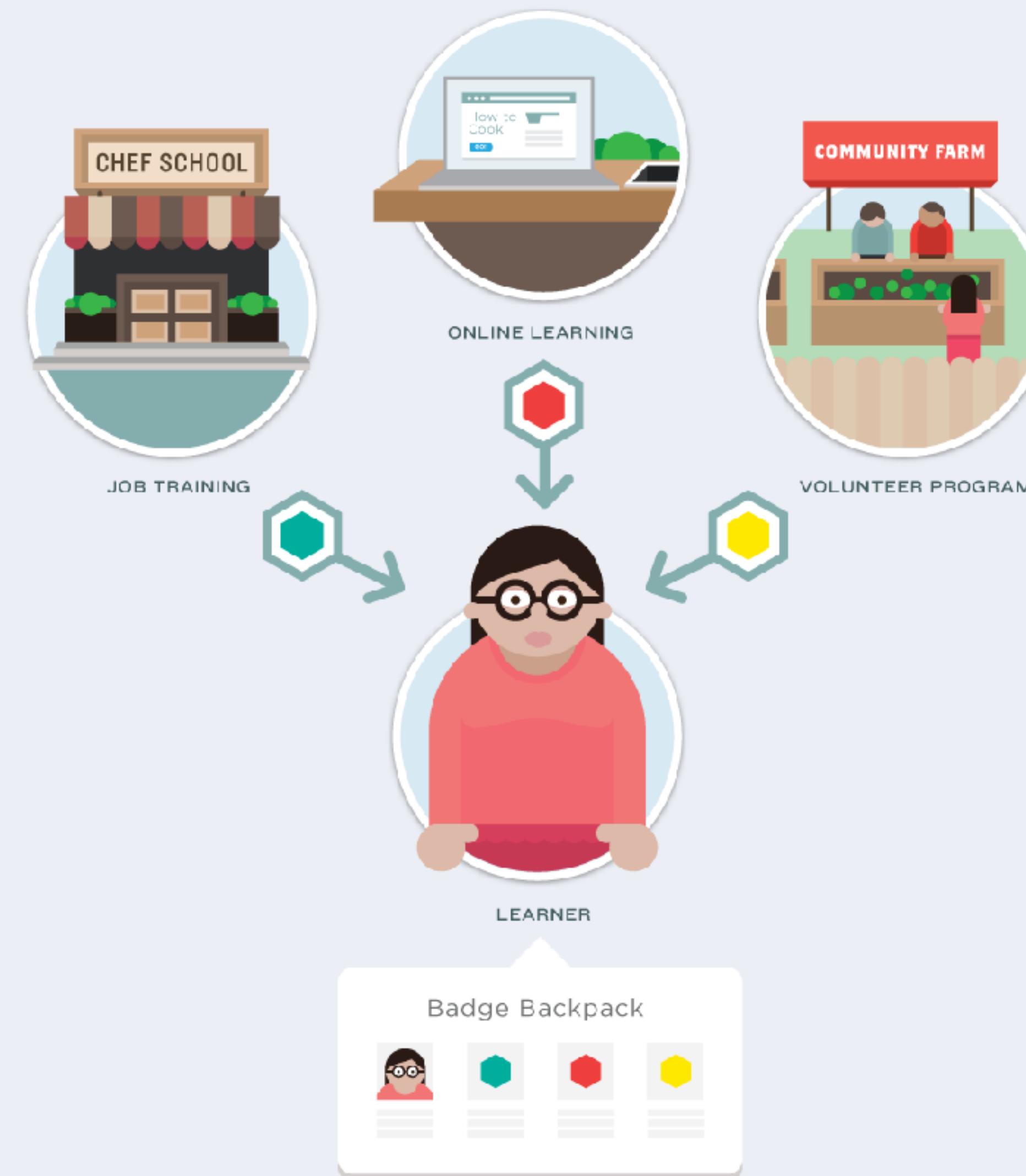
A credential infrastructure that responds to the changing nature of higher education, will recognize a wider range of experiences and achievements, and translate them into economic opportunity.

Learning and Employment Records (LERs) are digital records of a person's jobs and skills acquired through education, credentialing, in the workplace, and through service and life experience.



Open Badges help you share your skills & interests with the world:

OPEN BADGES v3

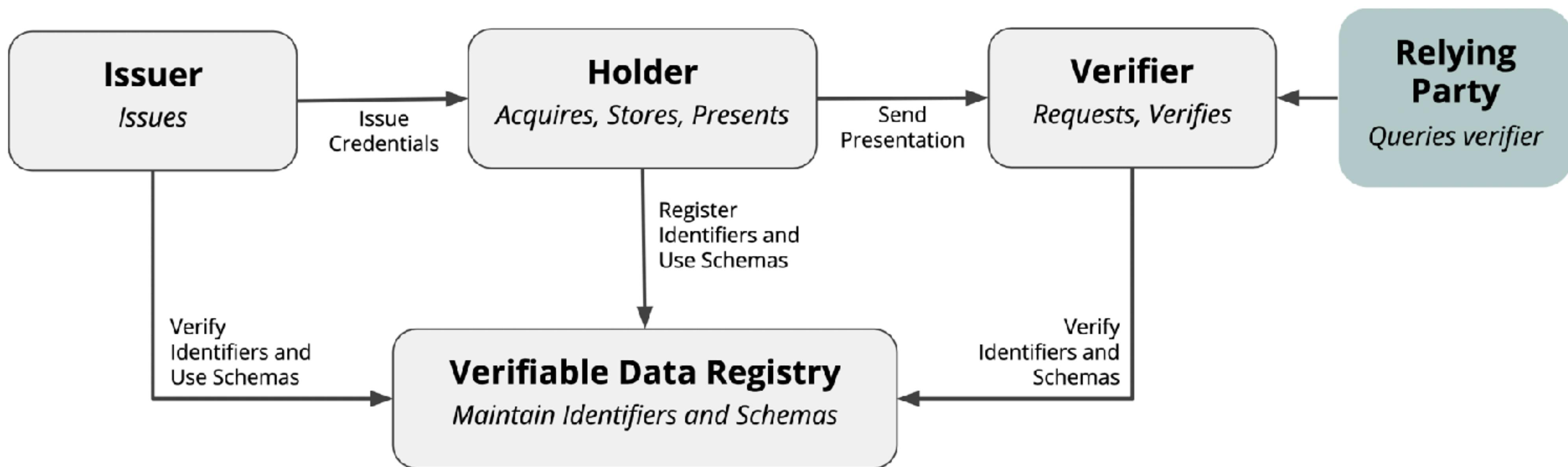


DIGITAL CREDENTIALS CONSORTIUM

A screenshot of a web browser window showing the Digital Credentials Consortium (DCC) website. The URL in the address bar is "digitalcredentials.mit.edu". The page features a large header with the "DCC" logo and the text "DIGITAL CREDENTIALS CONSORTIUM". Below the header is a navigation menu with links to "Home", "Who We Are", "Our Mission", "Our Technology", "Our Projects", and "Connect". The main content area contains a dark, semi-transparent background image of people working at laptops. Overlaid on this image is a large block of white text that reads: "We are building an infrastructure for digital academic credentials that can support the education systems of the future." At the bottom of the page, another block of white text reads: "White paper: [Building the digital credential infrastructure for the future](#)".

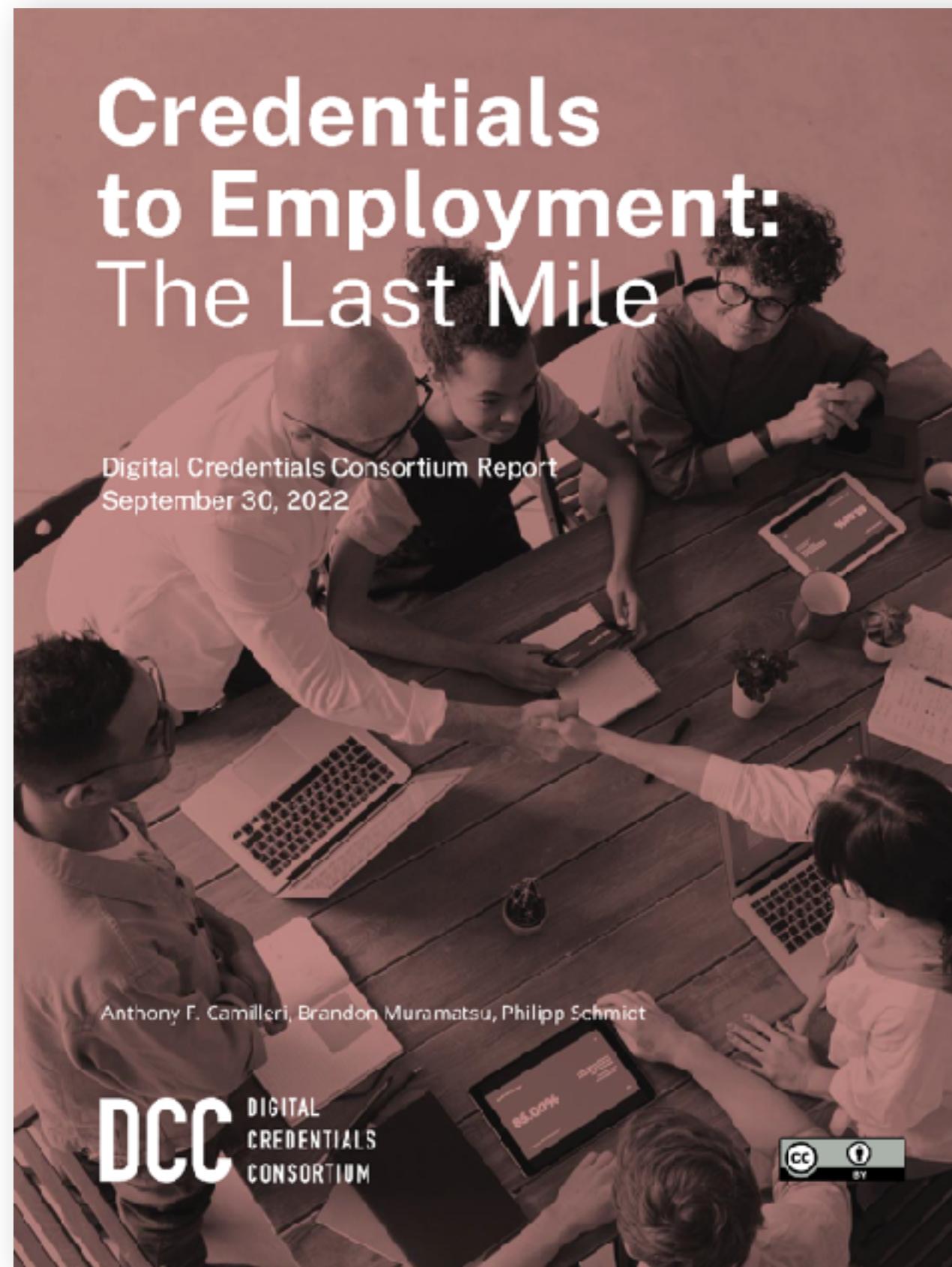
- **Learner agency:** Place the learner at the center of her professional and educational identity.
- **Issuer discretion:** Ensure that issuers maintain authority and flexibility over what is included in their credentials.
- **Portability:** Give learners/workers the ability to share and translate their credentials from one context to another and to represent them in different combinations for different audiences.
- **Verifiability:** Provide more reliable and efficient ways of verifying the authenticity of credentials. This is a fundamental aspect of increasing trust in novel forms of credentials.

W3C VERIFIABLE CREDENTIALS (VC)



Adapted from: W3C VC CCG

USE AND ADOPTION



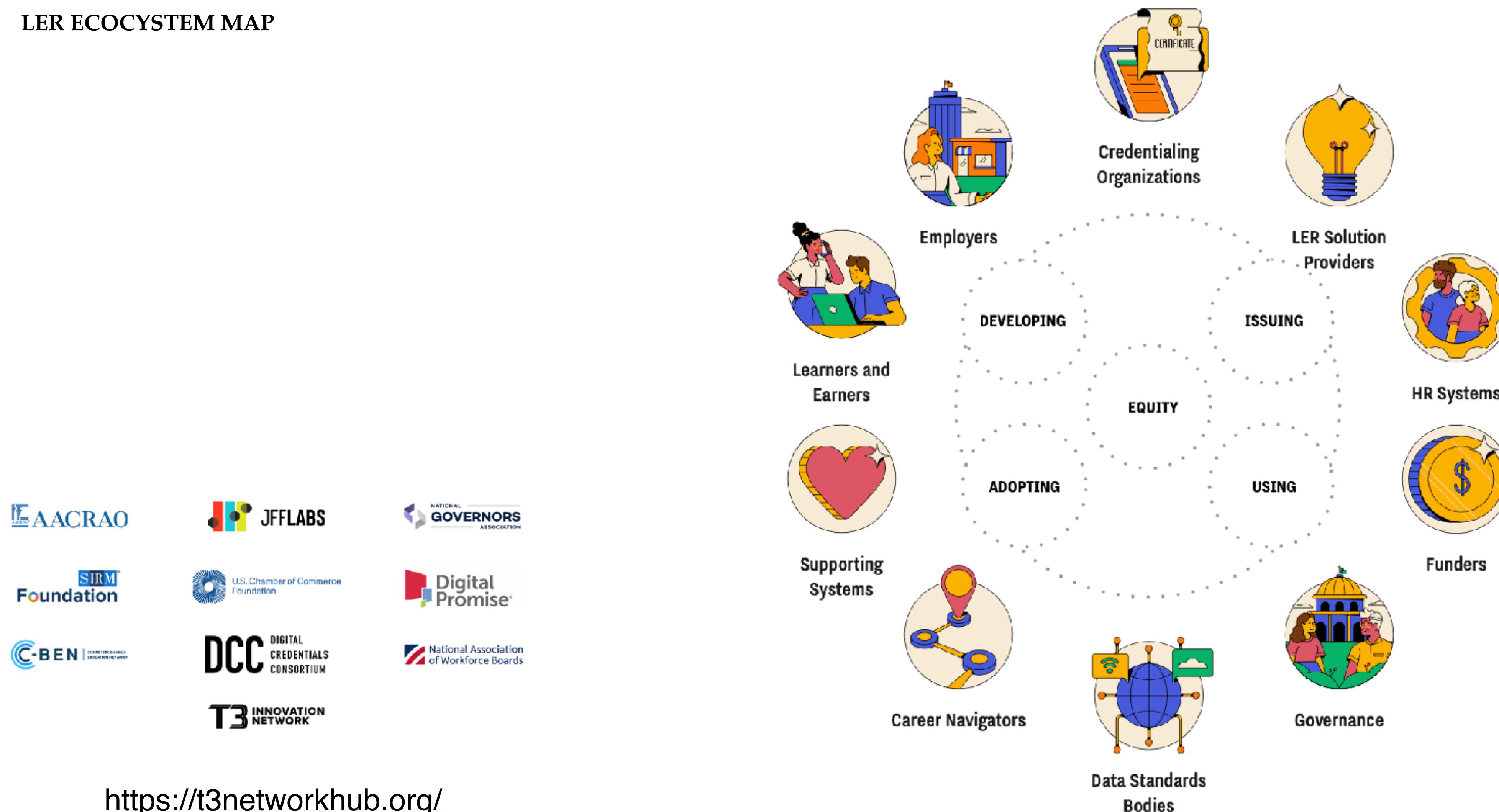
<https://digitalcredentials.mit.edu>

Implications for Higher Education

- Accelerate issuing digital credentials at scale
- Include skills and competencies wherever possible
- Support interoperability

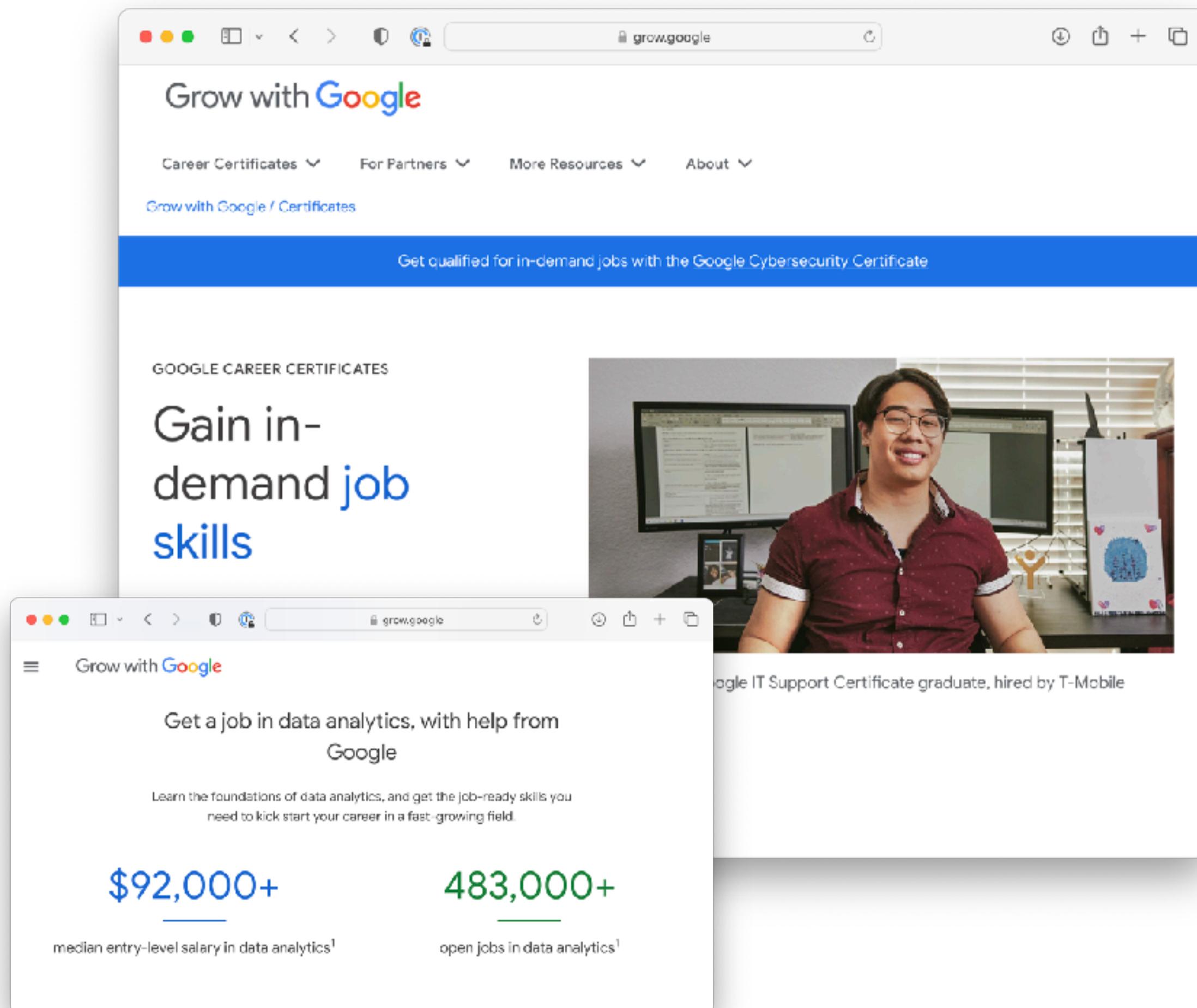
Lack of coordination between stakeholders (colleges, employers, HR systems, etc...) holds back adoption

LER ECOCYSTEM MAP



2 EXAMPLES

GOOGLE CAREER CERTIFICATES



Goal: Alternative path to good entry-level jobs
(in tech-focused careers)

- Fully online courses (on Coursera)
- 150+ employer partners
- 200k Graduates in US
(~40% already have BA/BSc)
- 400 higher education partners
(e.g. UT System, Coursera, Google)
(e.g. pathway into U North Texas bachelor's)
(free for community college partners)

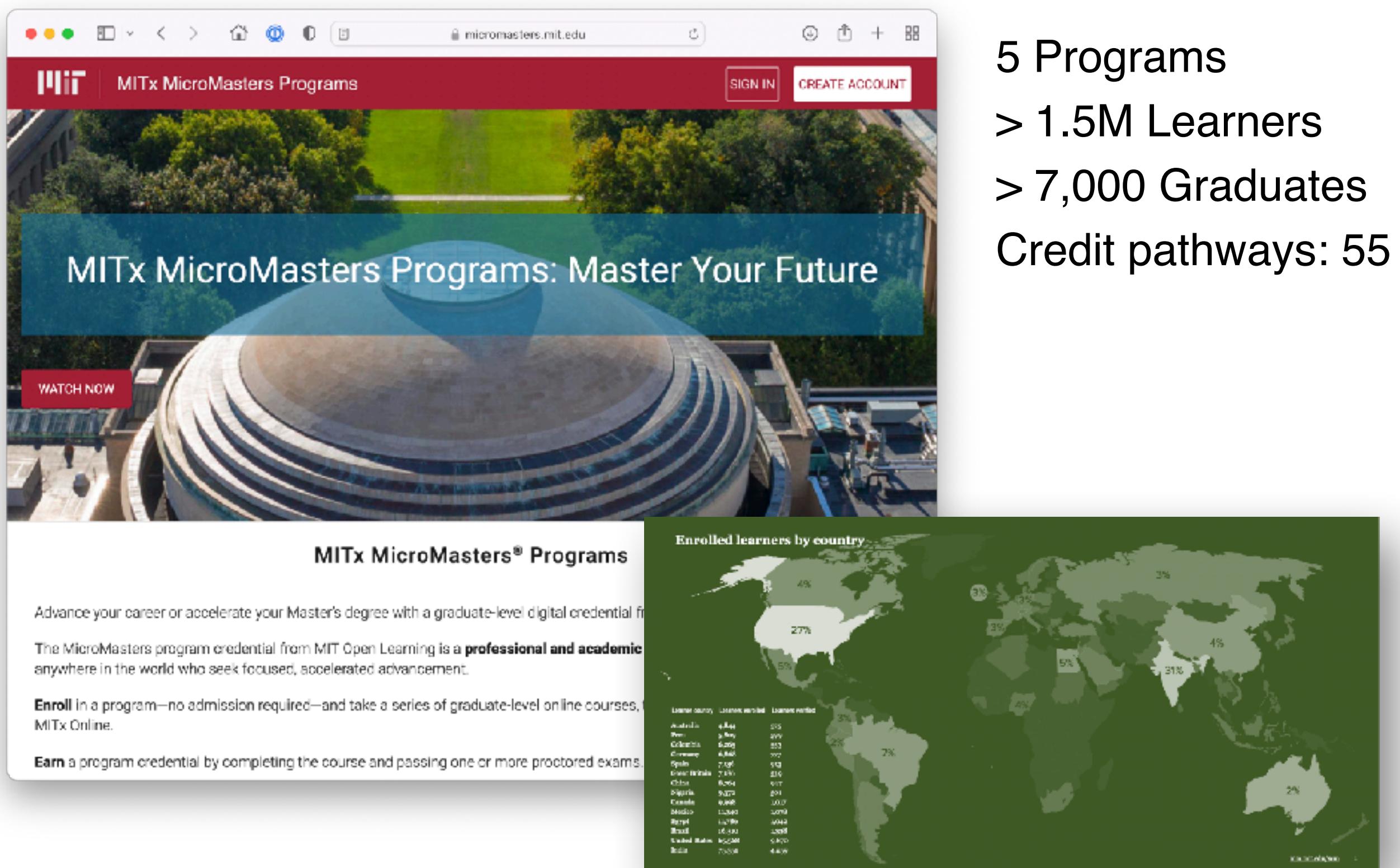
Value as an alternative pathway still relatively untested

LEARN OUTSIDE THE BOX

The image displays three separate browser windows showing different online learning platforms:

- Coursera:** A screenshot of a Coursera course page titled "IBM Training / IBM Credentials: Certification and Skills Badging". The page features a large title, a call to action ("Validate your skills. Earn an IBM Badge. Accelerate your career."), and a grid of course thumbnails.
- Google Grow:** A screenshot of the "Grow with Google" website. It shows a section for "GOOGLE CAREER CERTIFICATES" with a blue button labeled "Gain in-demand job skills". Below this, there's a section for "Google IT Support" with a large image of a person working at a computer.
- Google Grow IT Support:** A screenshot of the "Grow with Google" website specifically for IT Support. It highlights a median entry-level salary of "\$92,000+" and over 483,000 open jobs in data analytics.

MAKE CREDENTIALS STACKABLE



The screenshot shows the homepage of the MITx MicroMasters Programs website. At the top, there's a red header with the MIT logo and the text "MITx MicroMasters Programs". Below the header is a large banner featuring a photograph of the MIT Great Dome and the text "MITx MicroMasters Programs: Master Your Future". A "WATCH NOW" button is visible on the left side of the banner. The main content area has a white background with the title "MITx MicroMasters® Programs". It includes descriptive text about the program, a section for "Enroll in a program", and a section for "Earn a program credential". To the right of the main content is a world map titled "Enrolled learners by country" with percentages for each continent. Below the map is a table listing countries and their enrollment numbers.

Country	Enrolled learners	Completed
Australia	6,484	295
Peru	3,869	499
Colombia	3,650	353
Germany	2,997	—
Spain	2,730	532
Costa Rica	2,116	216
China	8,856	937
Egypt	9,072	291
Chile	2,003	203
Mexico	1,020	309
Brazil	1,670	494
India	1,630	288
United States	85,240	4,870
Kenya	7,651	4,439

5 Programs

> 1.5M Learners

> 7,000 Graduates

Credit pathways: 55 schools (30 countries)

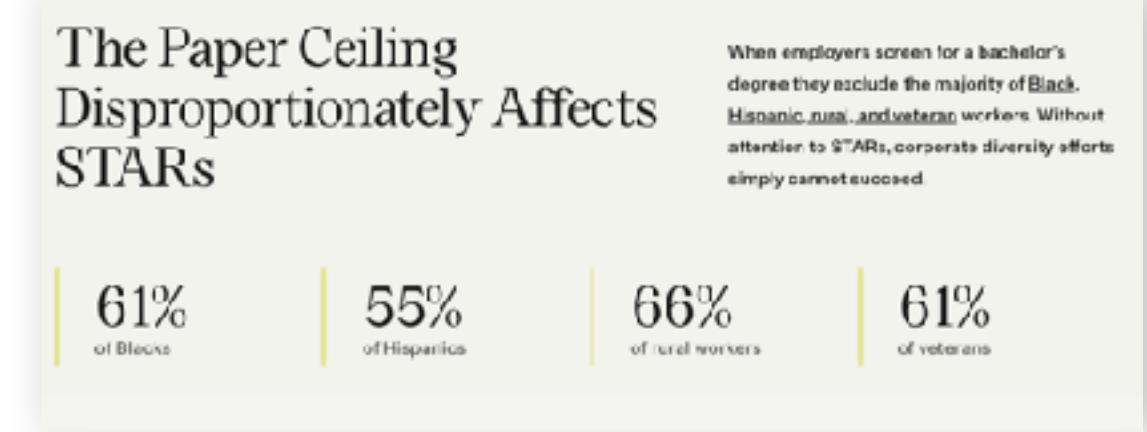
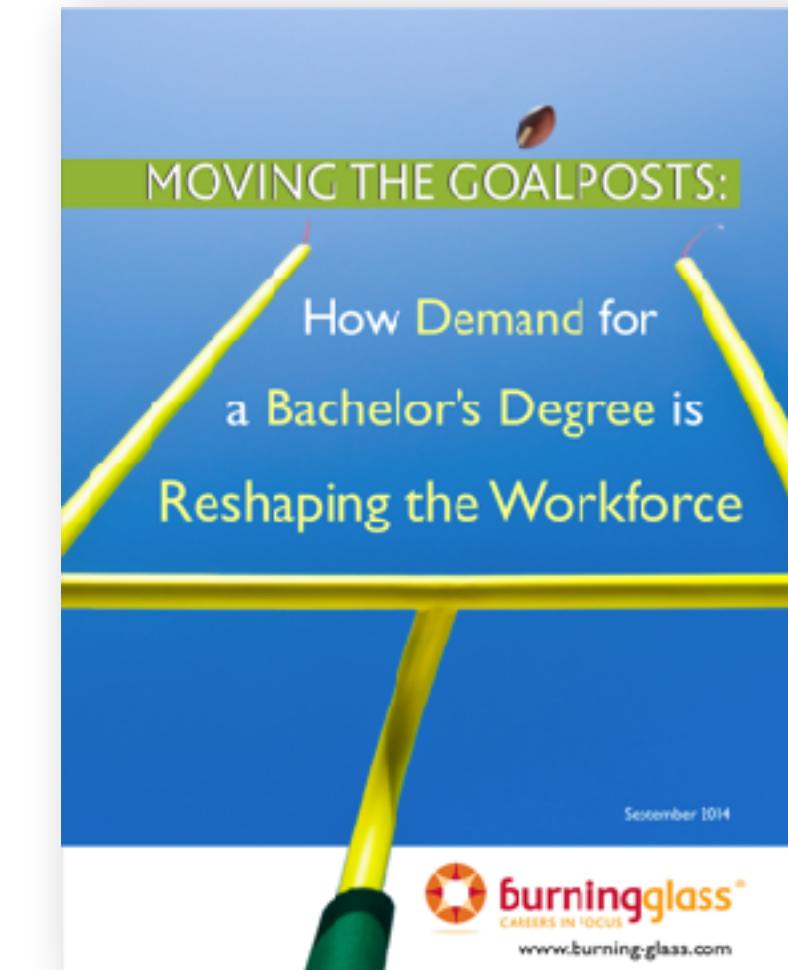
<http://micromasters.mit.edu>

THE PROMISE AND REALITY OF SKILLS-BASED HIRING

DEGREE INFLATION

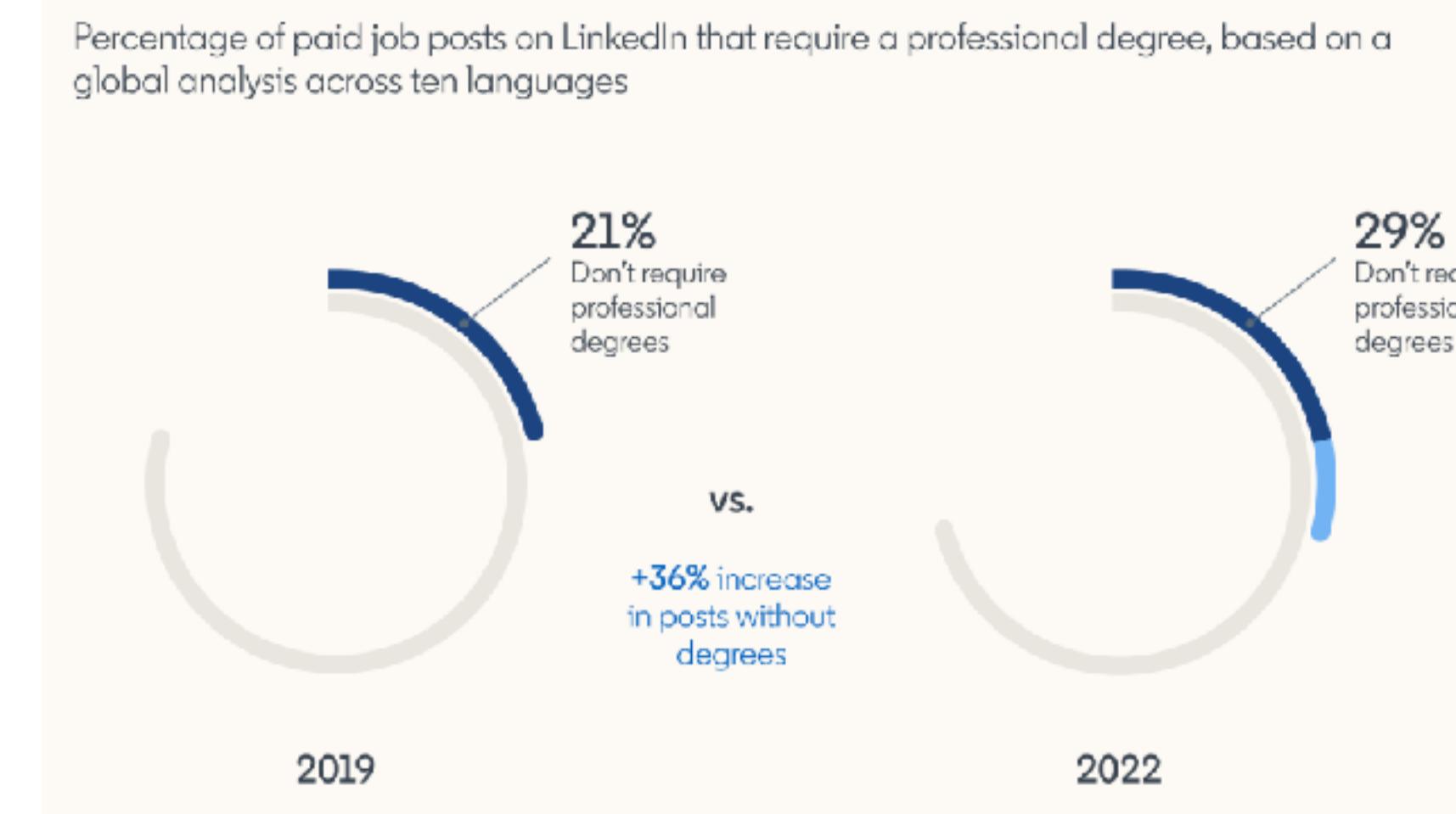
“65% of postings for Executive Secretaries and Executive Assistants now [2014] call for a bachelor’s degree. Only 19% of those currently employed in these roles have a B.A.“

“70+ Million adults in the U.S. are skilled through community college, workforce training, bootcamps, certificate programs, military service or on-the-job learning, rather than through a bachelor’s degree. This group is majority Black, Hispanic, essential workers and veterans.” Opportunity@Work

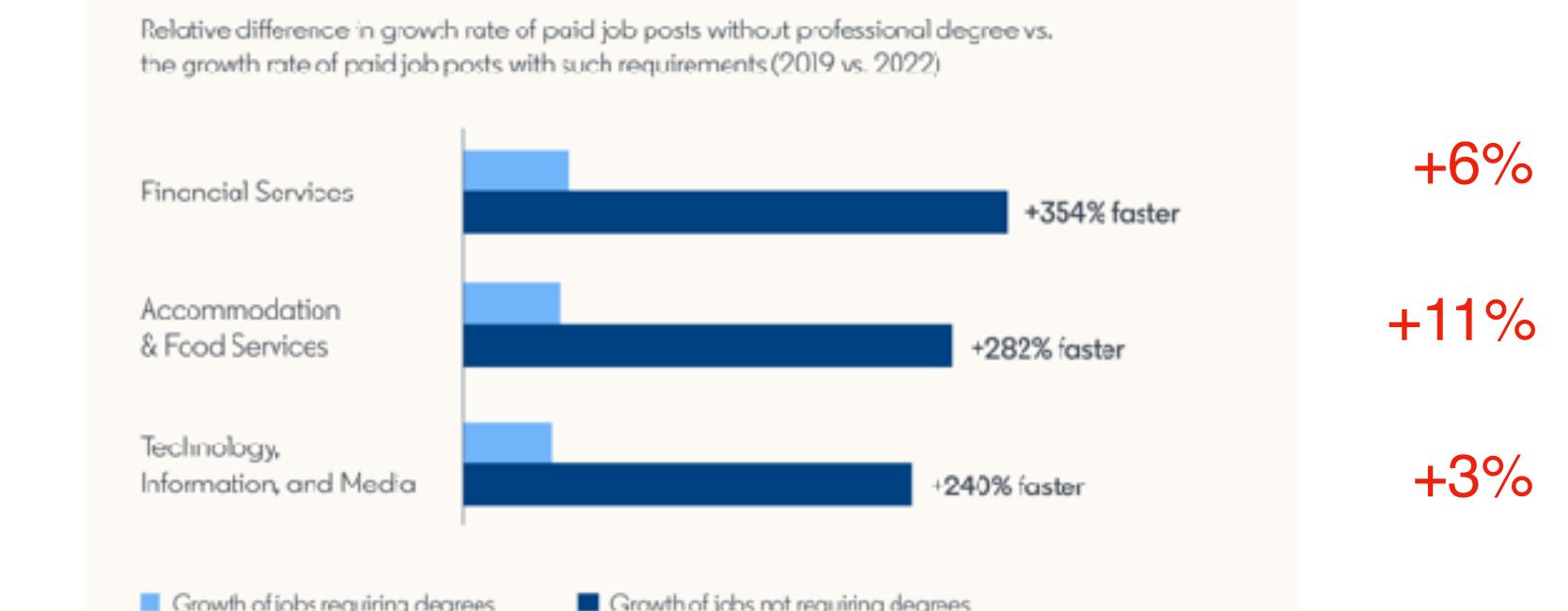


SKILLS-BASED HIRING

14 States (and counting) and many large employers have started relaxing degree requirements. “While the move toward “skills, not schools” is evident in job postings, the actual hiring behaviors haven’t necessarily caught up.”



Industries where **job posts** without degree requirements are growing faster than those with requirements



(Insights from LinkedIn, 2023)

SKILLS-BASED HIRING

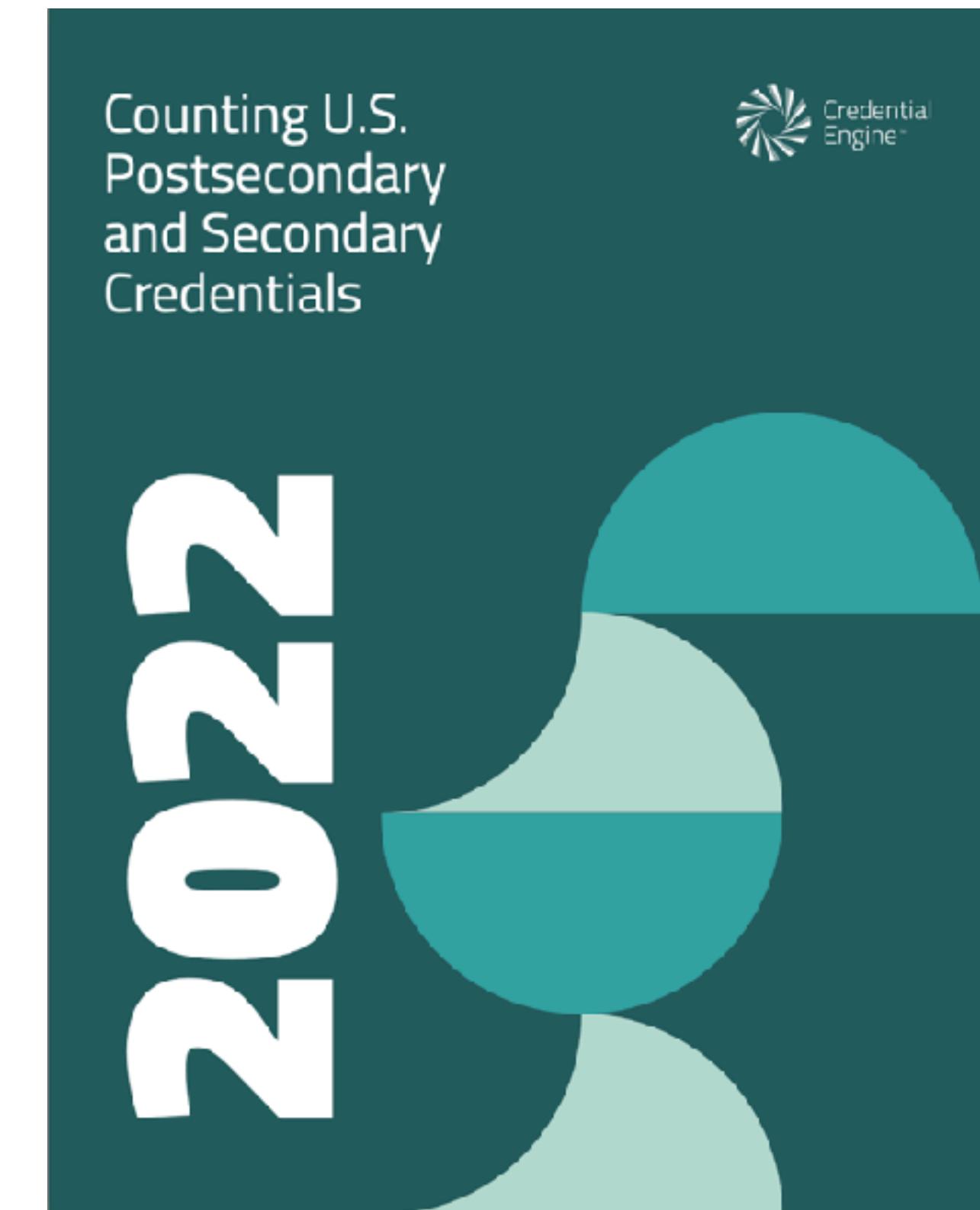


(SHRM Foundation)

MAJOR CHALLENGE: QUALITY

1,076,358 unique credentials in the U.S

- **Post-Secondary Educational Institutions:** 350,412 degrees and certificates
- **MOOC Providers:** 13,014 course completion certificates, micro-credentials, and foreign online degrees, etc.
- **Non-academic providers:** 656,505 badges, course completion certificates, licenses, certifications, and apprenticeships
- **Secondary Schools:** 56,179 diplomas from public and private secondary schools, etc.



MAJOR CHALLENGE: QUALITY

O*Net: O*NET database contains hundreds of standardized and occupation-specific descriptors on 923 occupations covering the entire U.S. economy. Taxonomy is periodically revised; the last revision was in 2019.

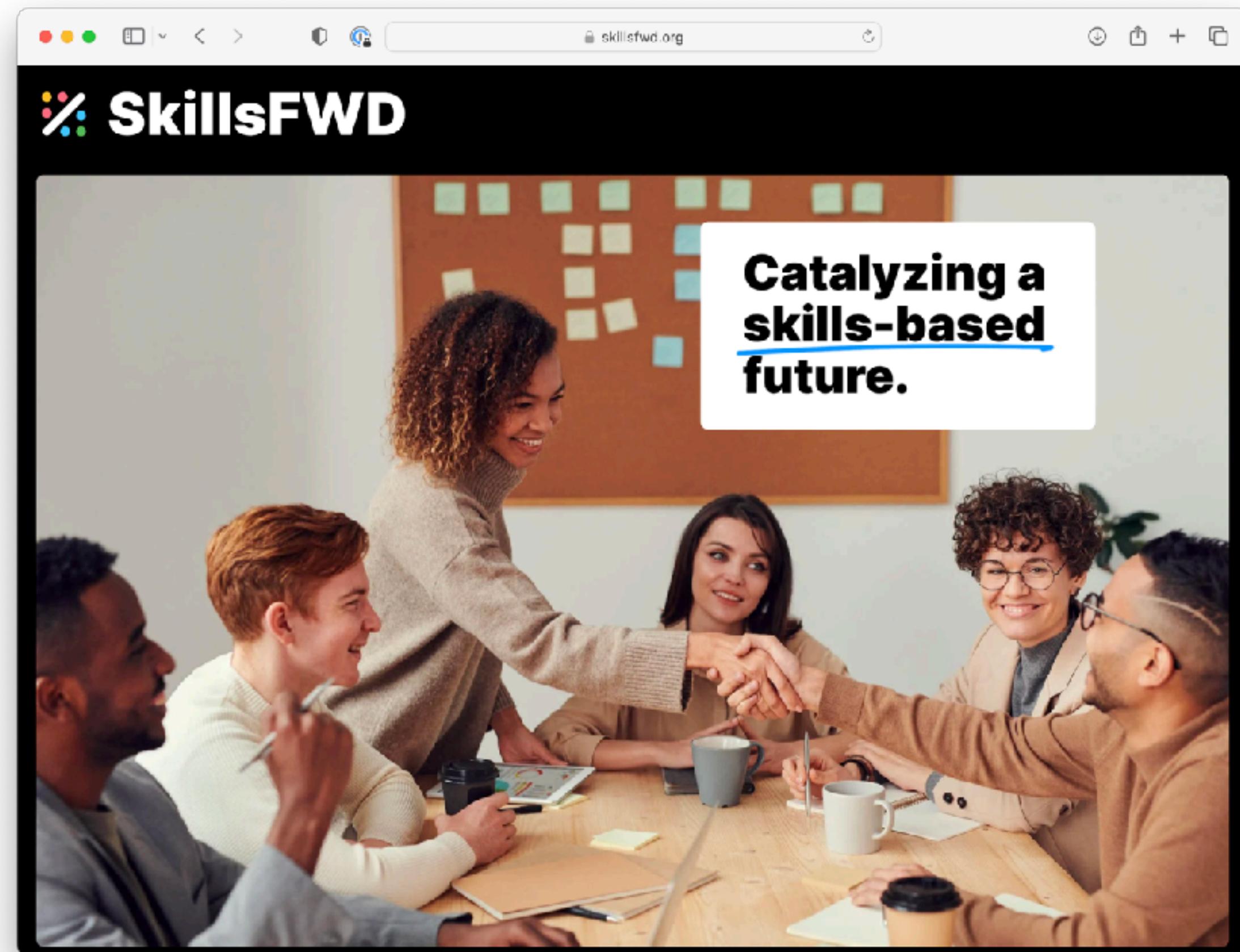
Lightcast: Skills library of over 32,000 skills that is updated every two weeks from online data (resumes, job postings, etc...).

SOLVING THE QUALITY CHALLENGE

Colleges could play a key role in solving this challenge

- **Building on existing expertise and experience**
- **Collaborating with non-education partners**
- **Leveraging AI**

PUTTING SKILLS-BASED
APPROACHES INTO PRACTICE



<http://skillsfwd.org>

CONTACT

J.Philipp Schmidt

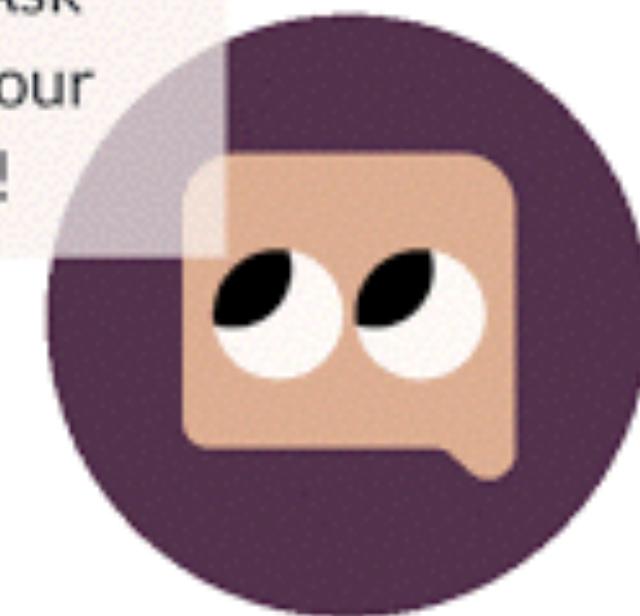
 phi.schmidt@gmail.com

AI

Changes **what** we need to learn, and **how** we might learn it

Could have massive impact on skills to career translation

Hi, I'm Khanmigo! Ask
me anything—I'm your
new learning guide!



What is a Digital Credential?

Two components

Document – is like the diploma a university issues to a graduate, which might contain the name of the recipient as well as a description of the credential they received

Envelope – protects the content of the document so it cannot be changed and it reliably communicates the authenticity of its contents

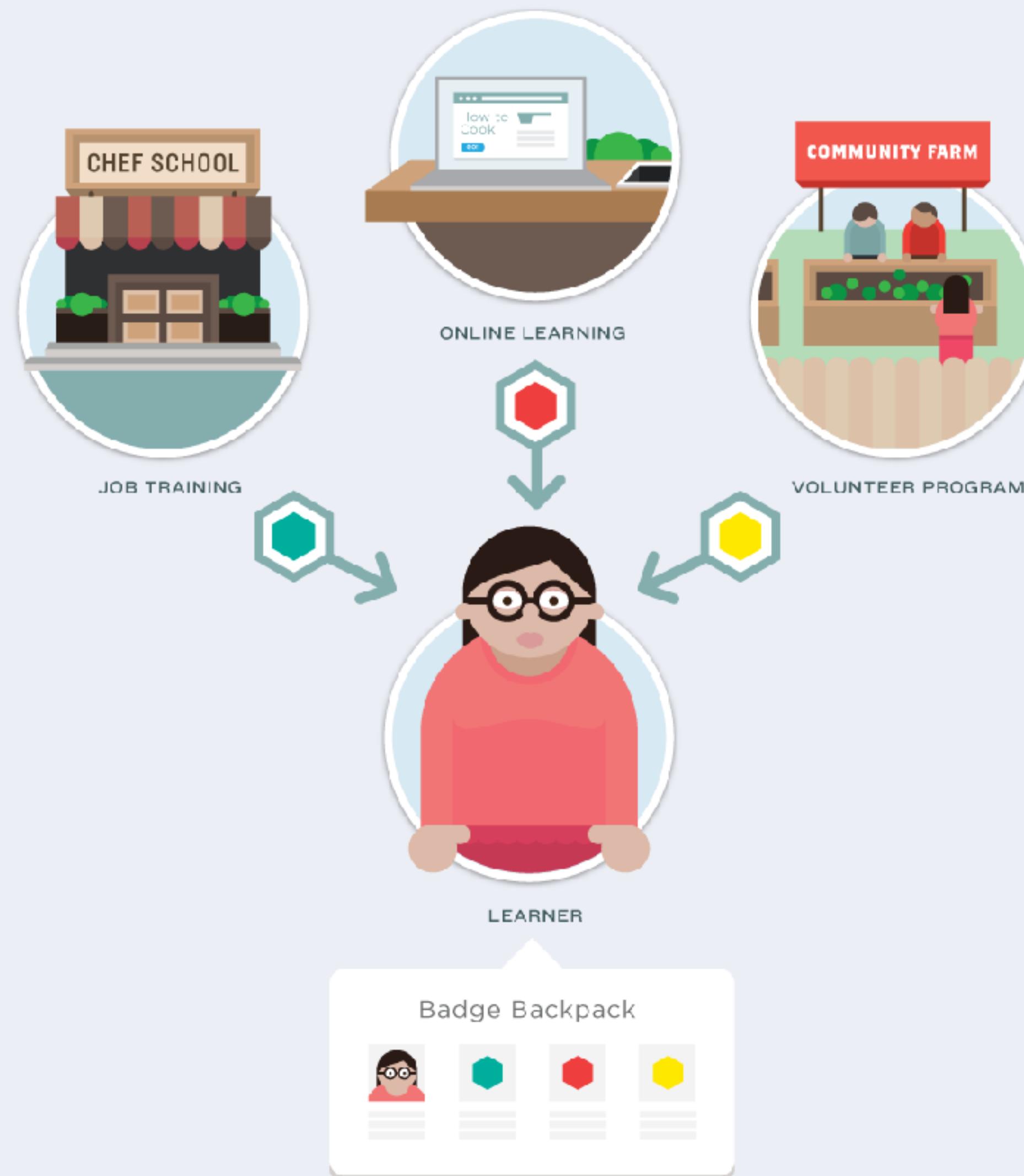
The Digital Credentials Consortium to date has focused on the envelope and the system that provides safe delivery and storage of multiple envelopes—similar to the postal service for mail.

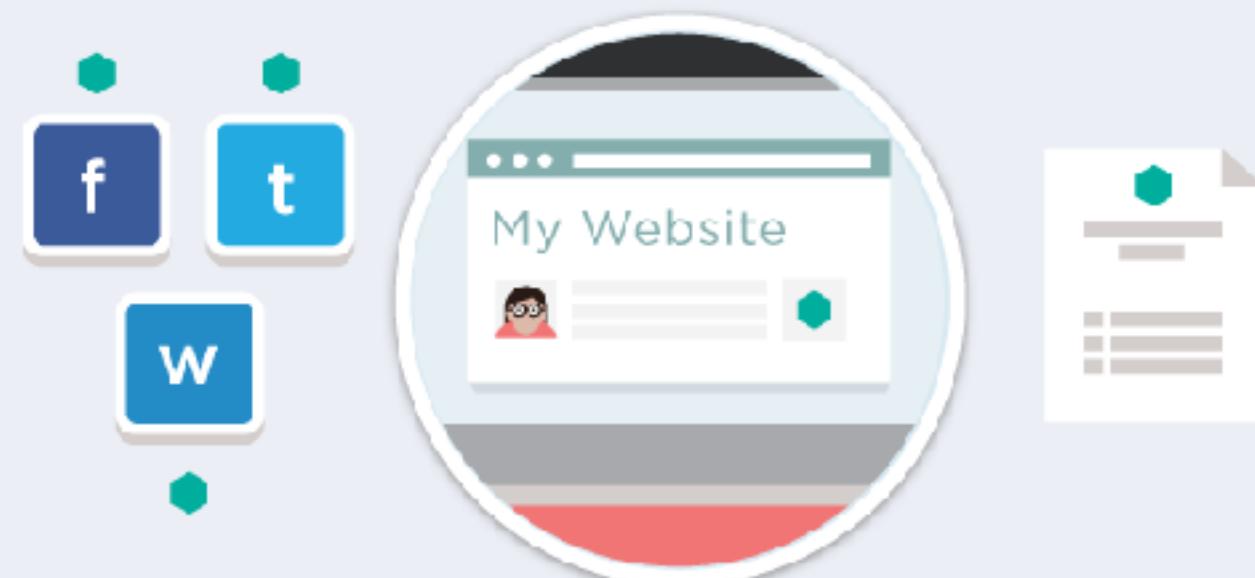
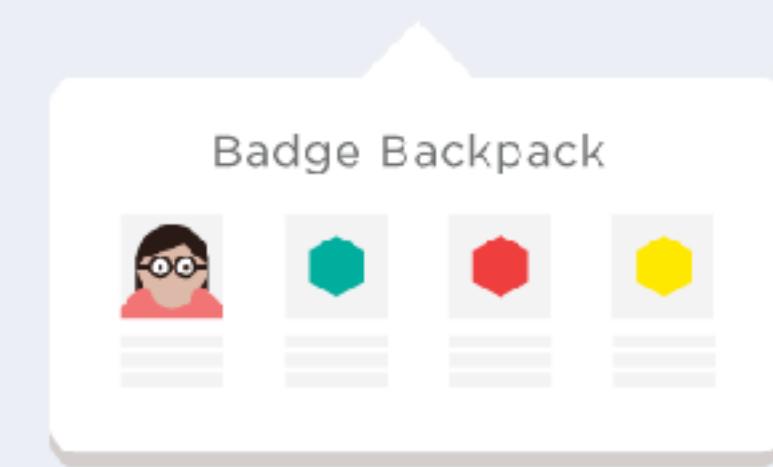
Open Badges (2011)

Many more new types of credentials that represent meaningful achievements and learning



Open Badges help you share your skills & interests with the world:





PERSONAL NETWORKS, SITES & MORE



LIFELONG LEARNING

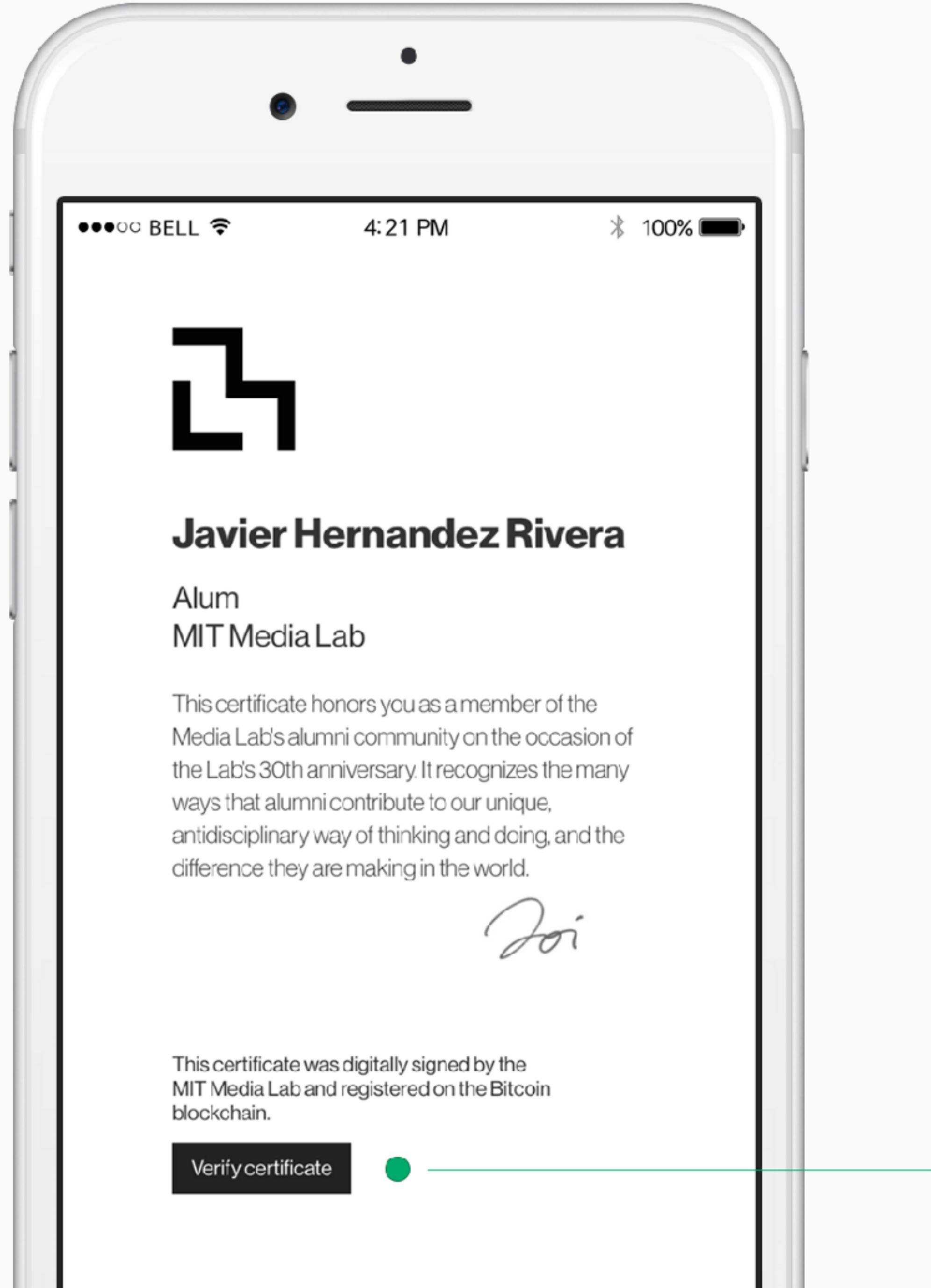


Media Lab Credentials / Blockcerts (2016)

Open badges & blockchains

Credentials are impossible to fake and can be verified without contacting the issuer.

Student can have true ownership

**Step 1 of 5**

Computing SHA256 digest of local certificate [DONE]

Step 2 of 5

Fetching hash in OP_RETURN field [DONE]

Step 3 of 5

Comparing local and blockchain hashes [PASS]

Step 4 of 5

Checking MIT signature [PASS]

Step 5 of 5

Checking not revoked by issuer [PASS]

Verified

Public Key

1HYPitzbwR83M3Smw6GWs5XeQzBWoJAeS

Blockchain Address

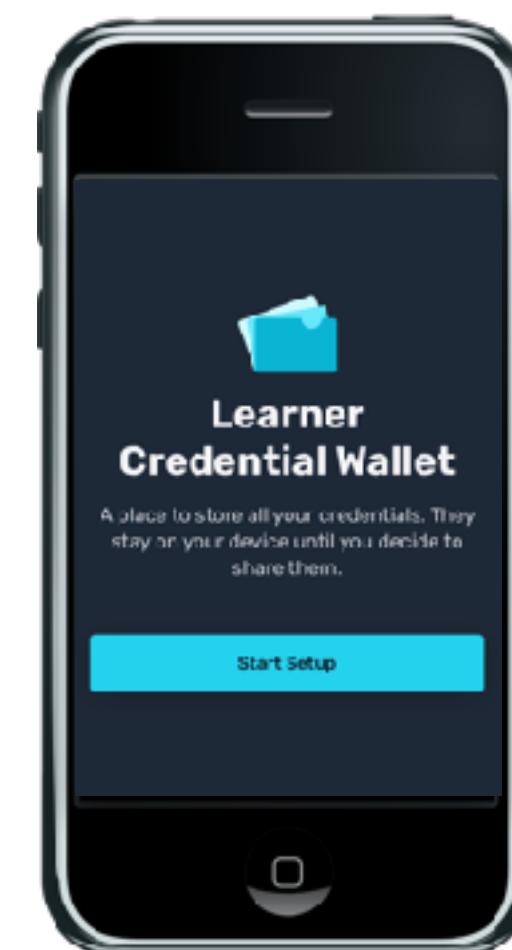
48f64ff1517554dac3496e9da0a28ca0ae492682b0898e38a4e17e7f90ee1295

Potential Benefits (and Risks) of Digital Systems

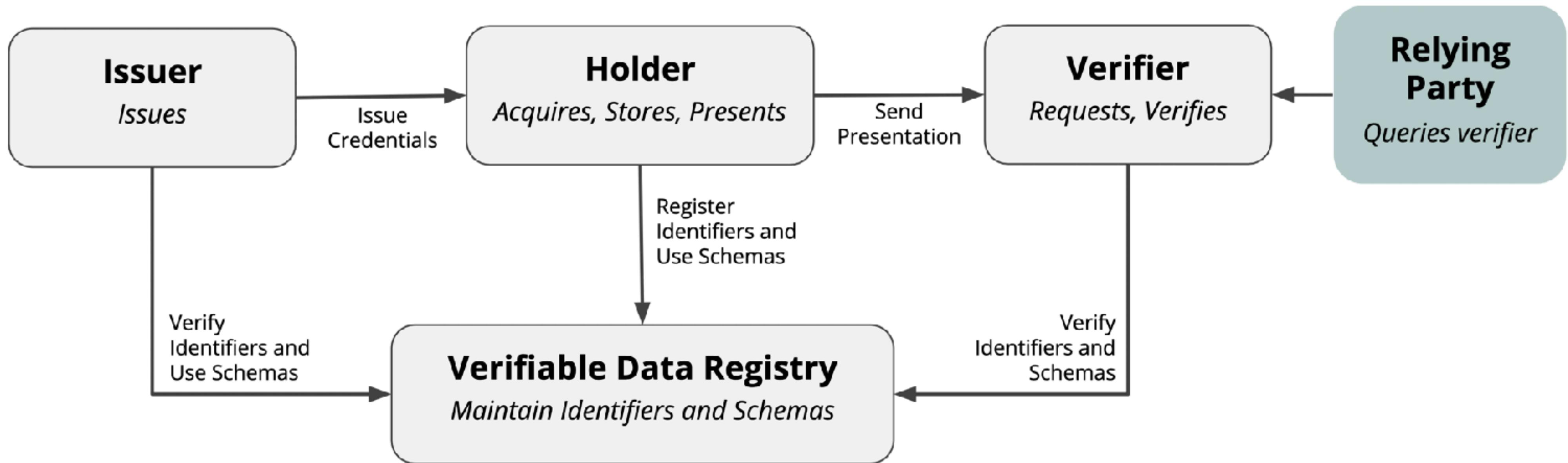
- (1) True student ownership
- (2) More trustworthy and de-centralized verification
- (3) More diverse meaningful types of credentials
- (4) More accurate data and insight (at higher resolution)
- (5) Increased ability to track and sort

CREDENTIALS

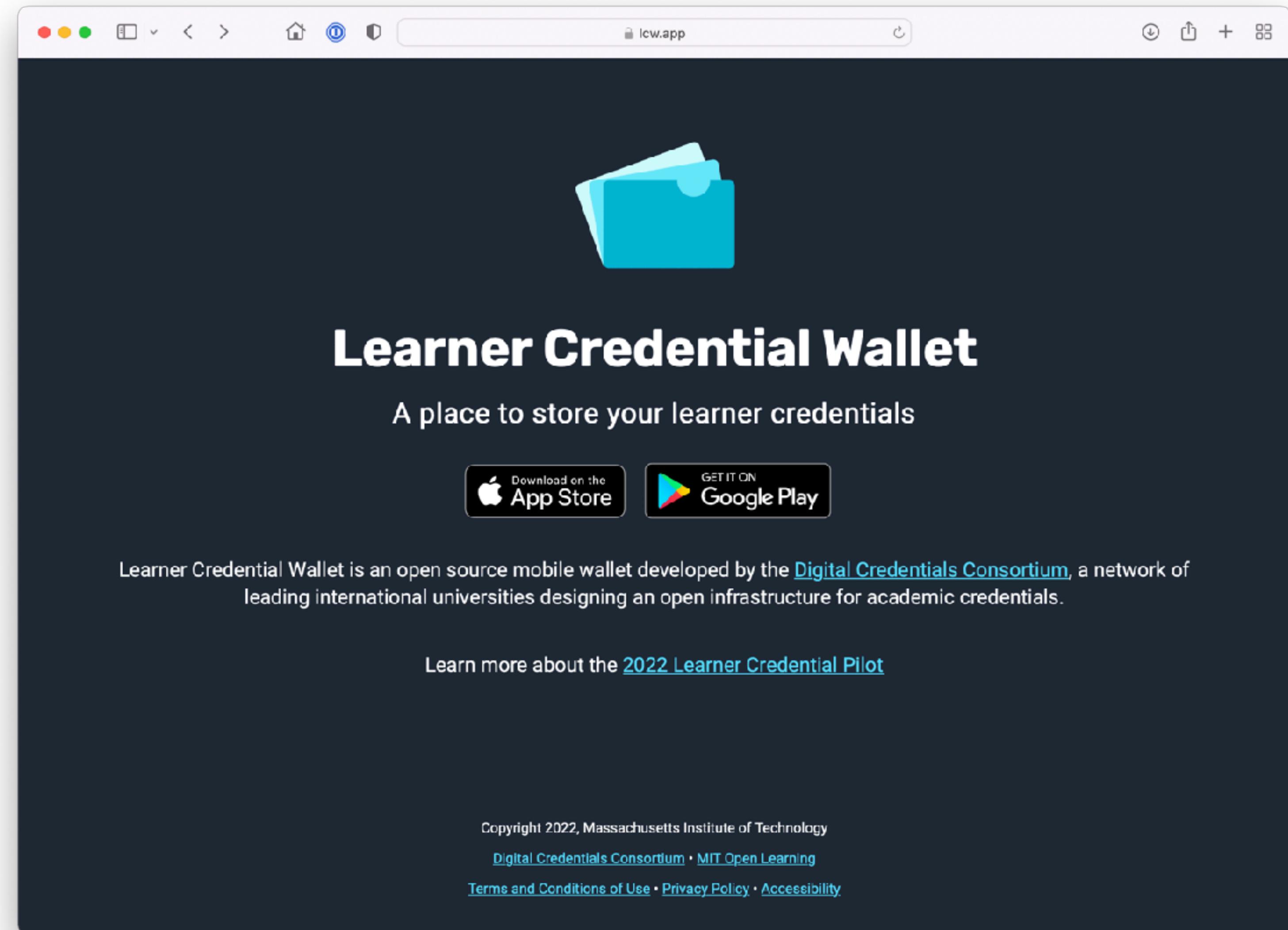
Digital
Credentials
Consortium
(2018)



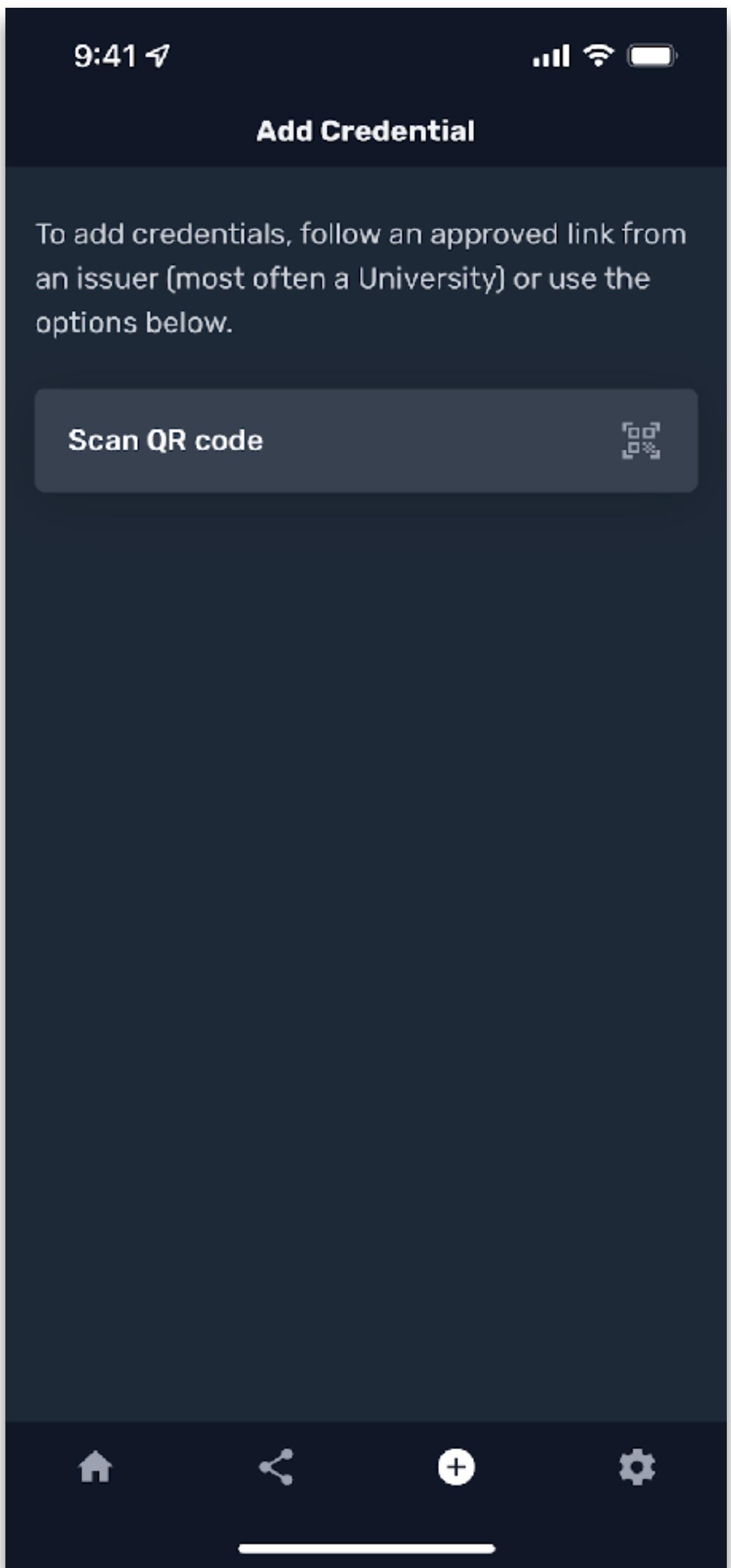
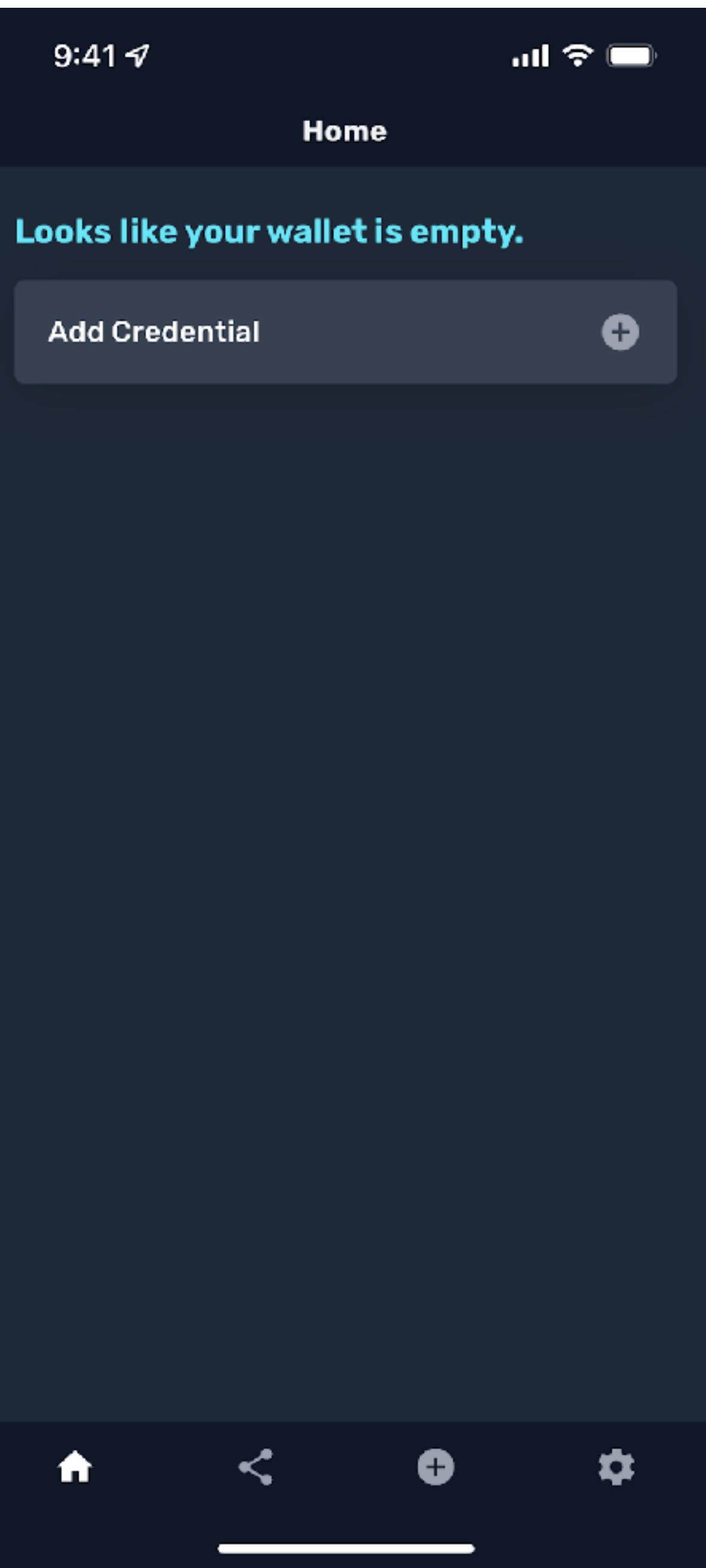
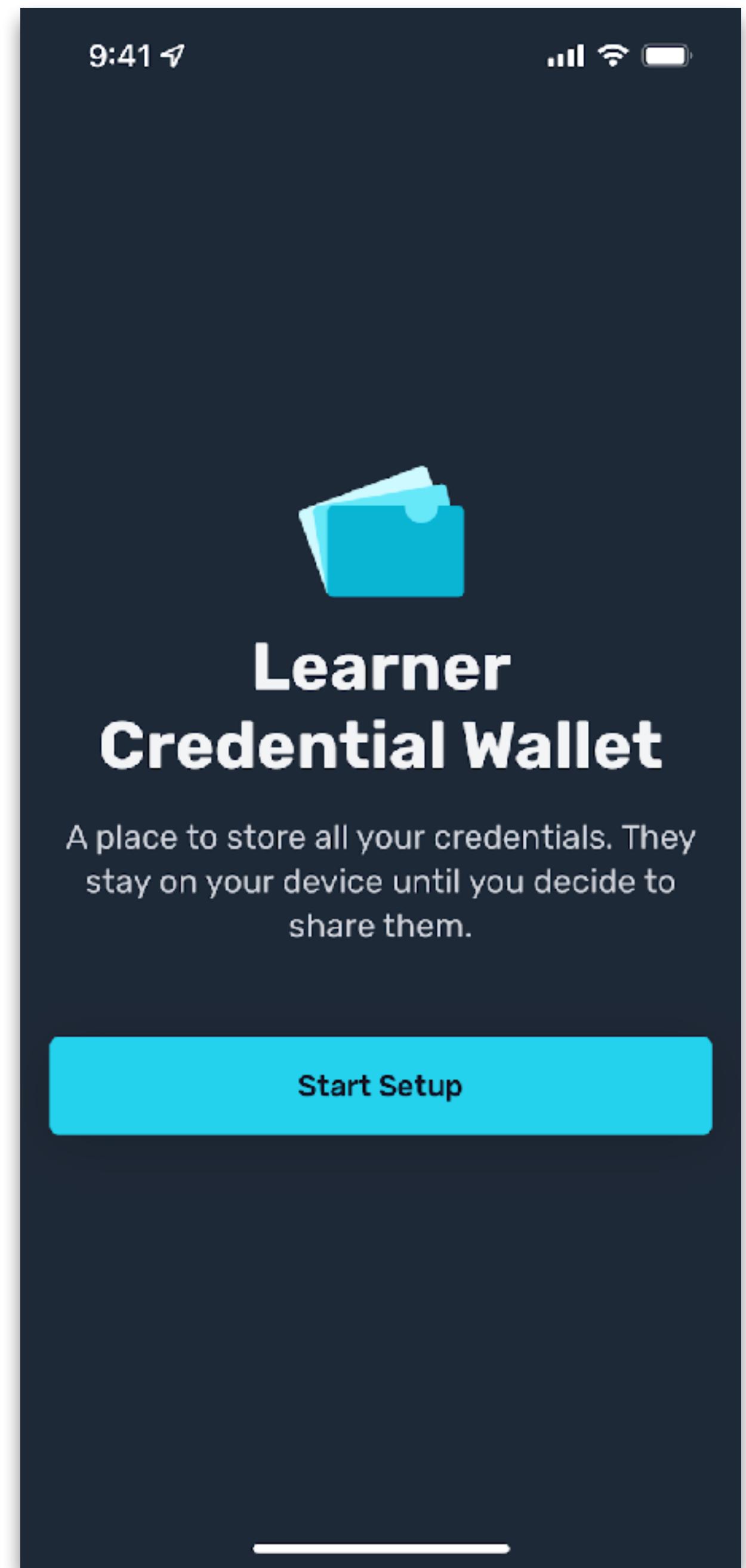
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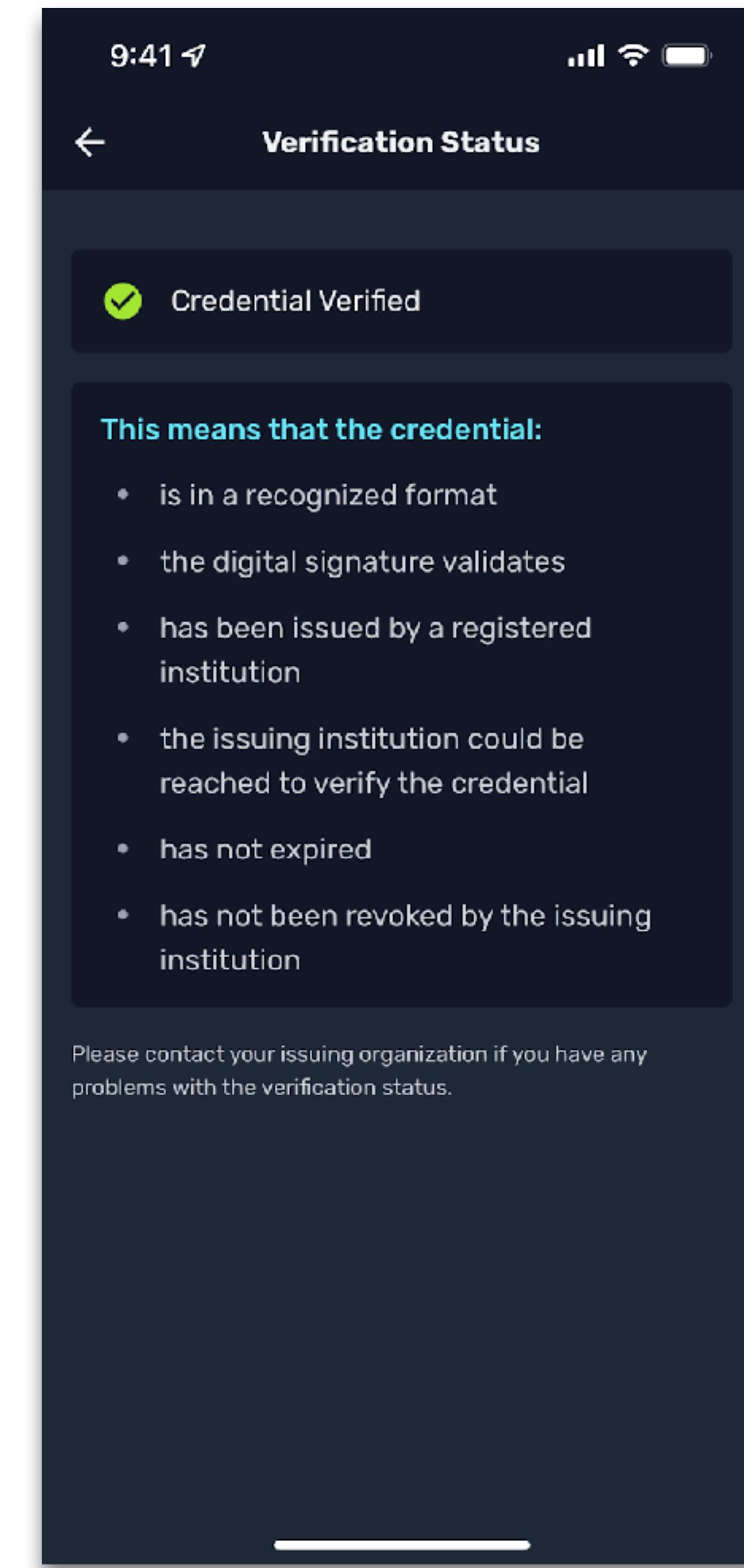
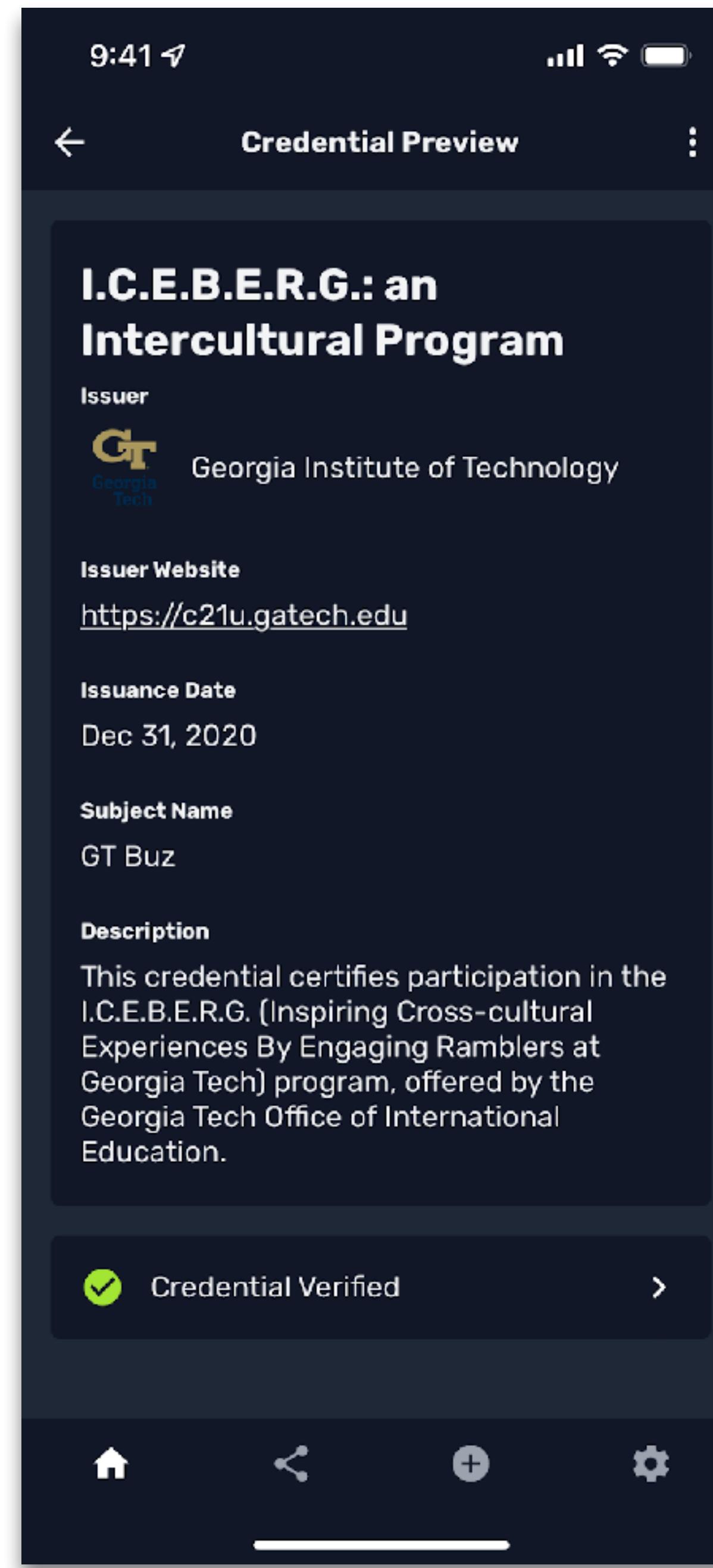
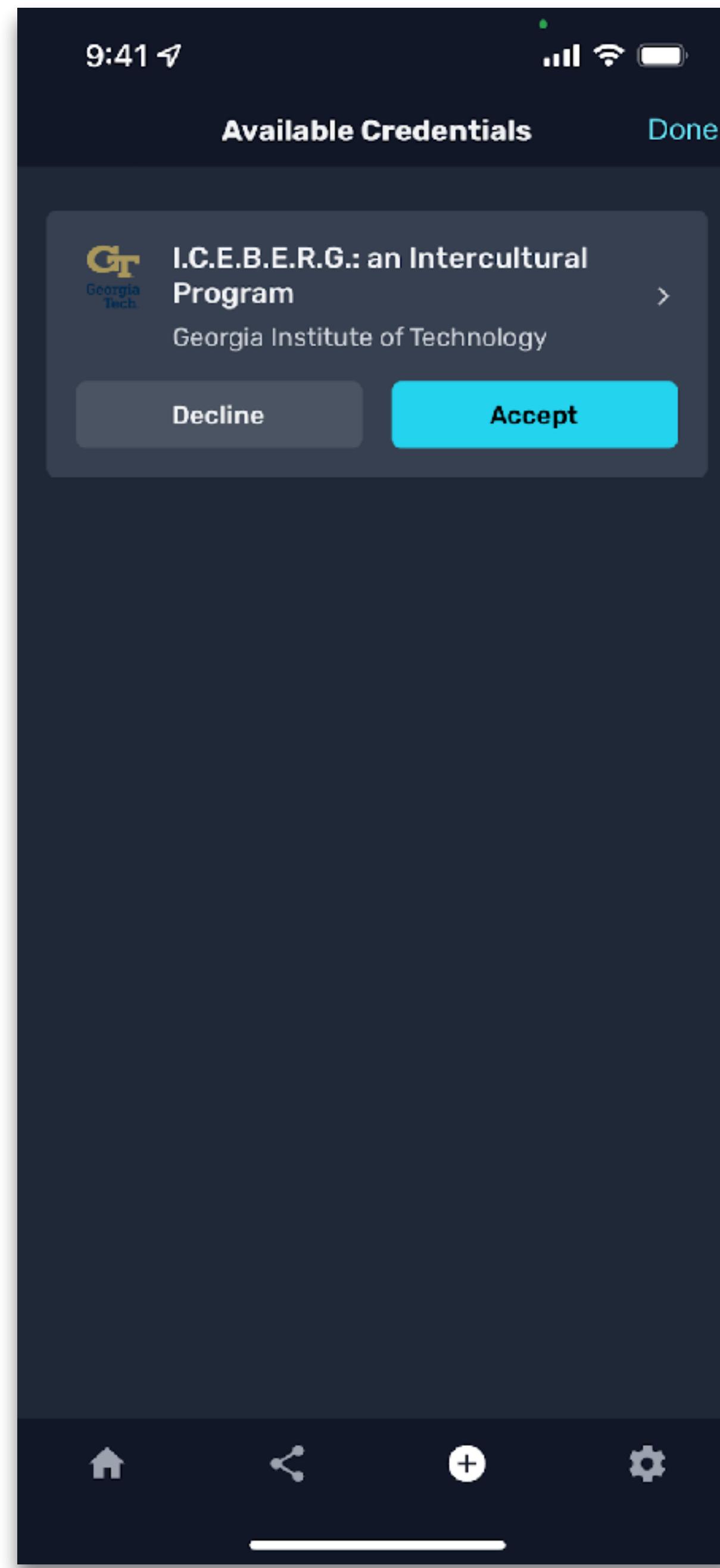


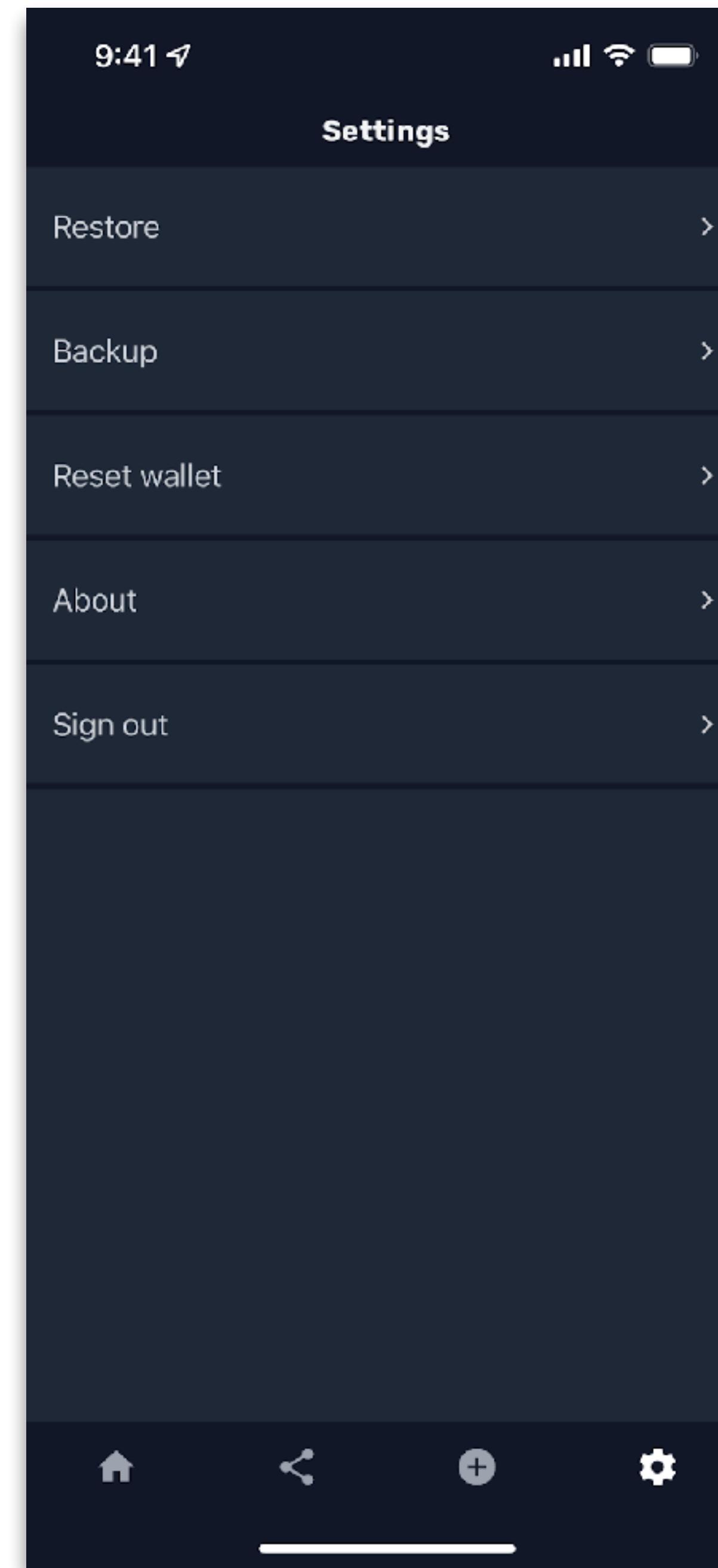
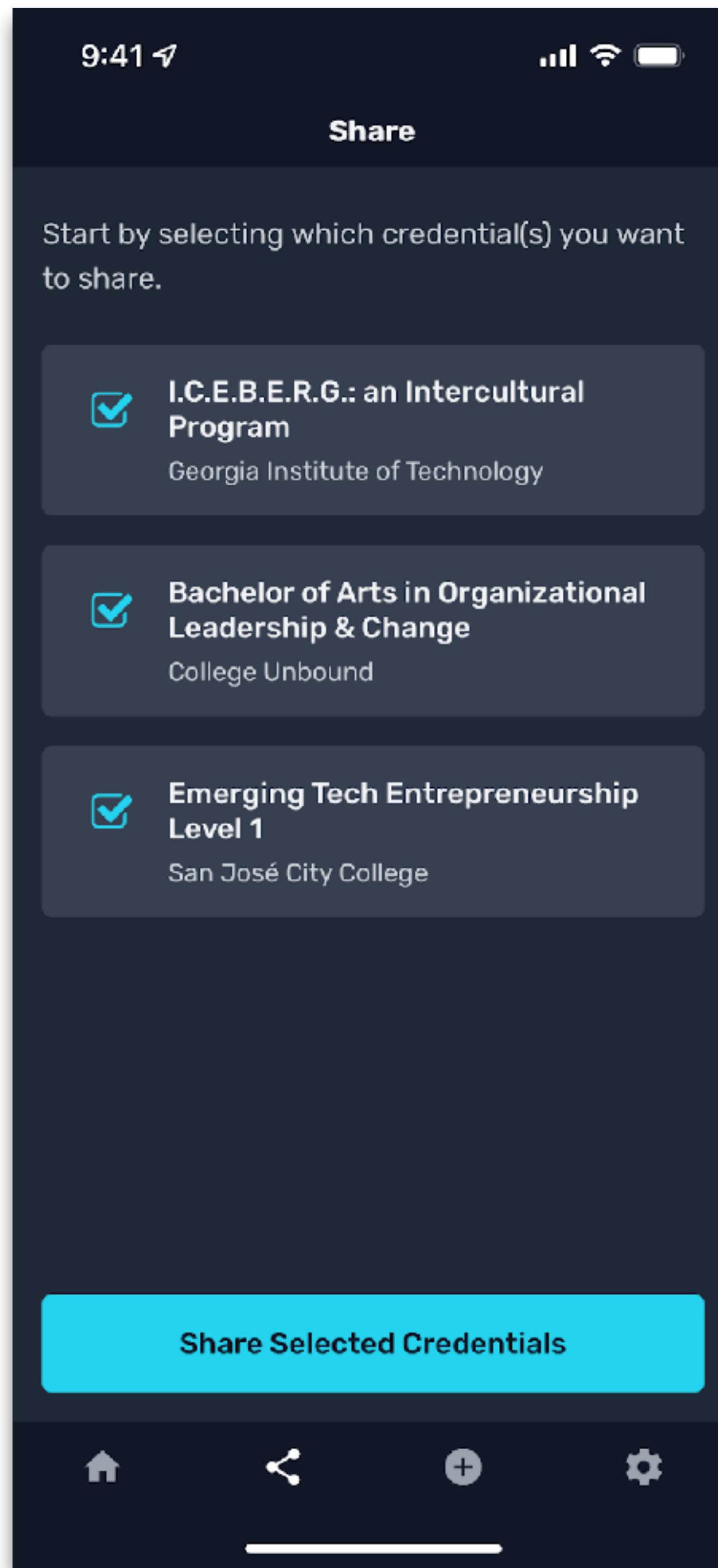
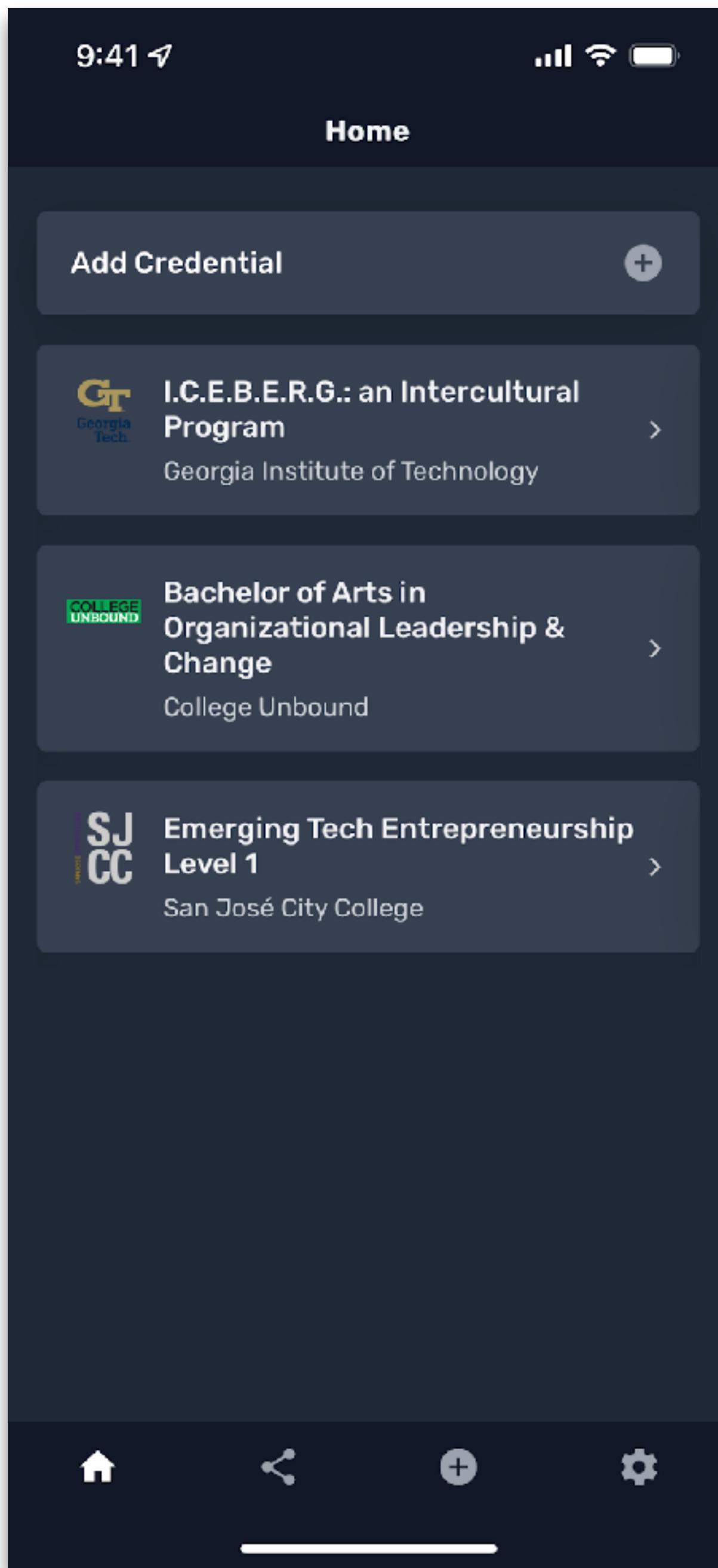
Adapted from: W3C VC CCG



<https://lcw.app>







Employer Perspective

- Increased reliability and efficiency in highly regulated industries
- Attractive to medium-sized enterprises who lack verification services
- Rich meta data (document <> envelope) enables skills-based hiring
 - Any taxonomy
- Upcoming report “Bridging the last mile” - **Online event (April/21)**

Credentials are core to the purpose of the university, creating and sharing knowledge.

Credentials exist within socio-technical systems, in which universities play an important role.

Technology enables new types of credential systems, which offer opportunities for improvements and also for monopolies or abuse.

It is in the interest of the higher education sector to take an active role as designers (and maintainers) of future credential systems.

DEMAND FOR A RANGE OF CREDENTIALS

