# Changing the Equation: Empowering Adult Learners with Edtech

**Power in Numbers**
**Advancing Math for Adult Learners**

## LUMINARY
### LABS

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## Learn More

Read more about Power in Numbers and sign up for the project newsletter here.

# From Theory to Practice: Improving Adult Education Outcomes

The 21st-century workplace is technology-rich and constantly evolving. Employers need highly skilled employees to meet the needs of the modern economy, yet America's publicly funded adult education system serves only 5 percent of the 40 million U.S. adults who have low literacy skills.[1] To stay competitive, adults need better access to education and training experiences that are high quality, afford-able, and adaptable. This includes math skills, which significantly affect employ-ability and career options.

Power in Numbers has led a three-year initiative to enhance the quality of advanced mathematics teaching and learning through next-generation technologies and open educational resources (OER). We have collaborated with nine subject matter experts (SMEs) and hosted four summits; convened 37 educators from 21 states as part of educator user groups; and reviewed more than 100 edtech and adult learning resources. To inform and equip administrators, educators, and funders with key insights and learnings from this work, Power in Numbers published a series of reports.
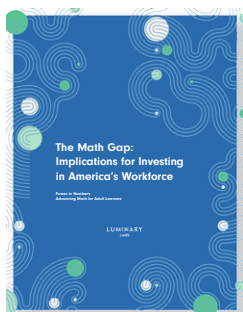
**Read the first report**

**The Math Gap: Implications for Investing in America's Workforce**
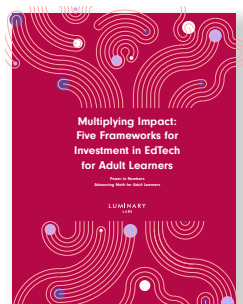
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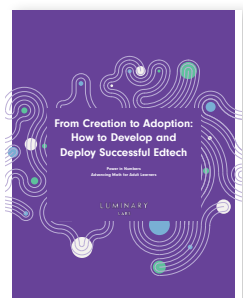
**Read the third report**

**From Creation to Adoption: How to Develop and Deploy Successful Edtech**

In this series, we investigated how OER are making math more accessible, adaptable, and applicable; detailed five frameworks for identifying impactful edtech; and explored pathways to create scalable edtech that meets the needs of multiple stakeholders.

In this fourth and final report, we present insights from each report, accompanied by case studies that illustrate how organizations have implemented these best practices in the real world. Through these case studies you will learn:

- How a state-wide OER initiative has saved an estimated $55 million in textbook costs for its university students.

- How an investment fund has supported the scaling of seven adult workforce technology companies.

- How professors at a community college piloted an innovative distance learning model that has improved minority students' course performance.

These case studies — featuring diverse stakeholders, actions and approaches, and lessons learned — prove there is not a single prescriptive path to supporting successful adult learning. Administrators, educators, and funders can apply the insights that work best in their unique contexts to advance adult education in their own communities.

# Report Highlights: The Math Gap

The global market for educational technology is expected to grow at a rate of 15.4 percent in the next three years, to reach $110.9 billion by 2022.[2] While most research, experimentation, and funding are focused on K-12 education, interest in the adult education space is increasing. Technology could offer solutions to many of the challenges within adult education, including systemic issues around access, resourcing, and contextualization.

Edtech tool creators and resource developers can better serve educators and learners by designing with the "Three As" in mind: accessibility, adaptability, and applicability. The "Three As" encapsulate and represent many ongoing cross-disciplinary calls to tailor new tools and approaches to the needs of adult learners and educators. They are explained in the first Power in Numbers report, "The Math Gap: Implications for Investing in America's Workforce."

## Adult edtech should be accessible

To address barriers of digital equity and literacy, adult edtech should be designed to be accessible from the outset. Accessibility encapsulates the ease with which all learners and educators, including those with disabilities, can access tools; it also addresses the discoverability and usability of resources, and the degree to which resources promote frictionless learning experiences.

## Adult edtech should be adaptable

There is no one-size-fits-all solution for adult education. Educators should be able to easily adapt new tools and technologies to fit the needs of their classrooms. Adaptability encompasses flexibility to meet particular curricular needs and contexts, reusability and affordability through educator-friendly licensing pathways, and alignment to relevant pedagogical or andragogical approaches.

## Adult edtech should be applicable

Applicable edtech must be designed with the users in mind. Resources should align with career pathways and credentials, and aim to impact learner mindset, not just learner knowledge. Contextualized resources are grounded in real-life scenarios, and their use is a best practice in the development of new resources that are culturally sensitive and relevant to users. The use of these resources improves curiosity and learners' drive to "puzzle it out."

Different types of contextualization include resources around particular skills, curricula around career pathways, learning delivery aligned with learner mindset and experience, and programs that meet learner goals.

Contextualization is a well-known approach in the development of OER. MERLOT, the "teaching commons" for OER, exemplifies specific resource contextualization.

### The "Three As" and Open Educational Resources

OER are free and often low-tech teaching and learning materials. They reside in the public domain or have been released under an open license that permits free use and repurposing by others. OER encapsulate accessibility, adaptability, and applicability, as they enable redistribution, revision, and remixing.

Employers, learners, and educators can all benefit from OER. In 2016, the U.S. Education Department announced 13 state commitments to advance OER.[7]

**Read the full report, "The Math Gap: Implications for Investing in America's Workforce."**

# Case Study: How Affordable Learning Georgia Meets the Needs of Adult Learners

### Project and goals

Between 2002 and 2013, textbook costs rose at nearly three times the rate of inflation.[8] The University System of Georgia (USG) identified a link between affordability and student success, and created Affordable Learning Georgia (ALG) to address the need for more affordable materials. ALG is a USG initiative that supports the adoption of OER like OpenStax textbooks to increase rates of student retention, progression, and graduation.

### Actions and approach

To guide its work and champion OER across the state, ALG defined six long-term goals and the actions it and USG are taking to support them:

1.  **Implementing open and affordable resources in courses.** USG funds Textbook Transformation Grants to help educators create and implement OER effectively. Additionally, ALG partners with eCore, the state's collaborative online program, to ensure all eCore courses are OER-based.

2.  **Creating, maintaining, and improving OER.** ALG provides training for all Textbook Transformation grantees. It also partners with the University of North Georgia Press in the creation of new open textbooks to publish OER and offer services to creators.

3.  **Improving open pedagogy through faculty and staff training.** As OER adoption increases, USG is implementing pedagogical strategies, methods, and technologies that focus on what instructors can do differently in their teaching now that resources are open.

4.  **Raising awareness of OER, open pedagogy, and other low-cost learning materials.** ALG uses marketing campaigns and communications resources to raise awareness of OER on campuses. Additionally, as of fall 2018, USG has required registration materials to include a flag to help students choose courses with no-cost or low-cost materials.

5. **Increasing OER discoverability online and within library systems.** The ALG Campus Champions and Library Coordinators program helps students, staff, and administrators find and select OER.

6. **Expanding and improving ALG data collection, analysis, and reporting.** ALG grantees track efficacy by comparing student performance before and after OER adoption.

*"We're not just looking to make costs go down in the USG. We're looking at ways to increase equity in the classroom. This is very important as time goes on and vendors start coming up with solutions to reduce costs. Ask yourself, are these solutions in the best interest of all of your students?"*

**Jeff Gallant, Program Manager, Affordable Learning Georgia**

## Results
Since 2014:

- 170 OER projects have been completed and 60 projects are currently in progress — all funded by Textbook Transformation Grants.[9]

- USG-sponsored textbook affordability programs have saved nearly 321,000 students an estimated $55 million in textbook costs.[10]

- A large-scale study has found that University of Georgia students provided with free course materials at the beginning of a class achieve significantly better academic results than those who do not receive free materials.[11]

**EDUCATOR SPOTLIGHTS**

**Dr. Peggy Brickman**, a Concepts of Biology instructor at the University of Georgia, wasn't satisfied with commercial options for course resources. She wanted to tailor a textbook to her course and worked with OpenStax to create "UGA Concepts of Biology." Dr. Brickman's success helped prove the value of customizing the materials for the course instead of customizing the course to the materials.

**Dr. Mark Kunkel**, an Introduction to Psychology instructor at the University of West Georgia, brought students into the process of creating instructional materials. He used a collaborative document to share knowledge, feedback, and experiences throughout the course and established a method for integrating OER creation into his pedagogy.

## ALG's learnings

The ALG leadership shared the following key learnings from their experience.

### Academic freedom should always be at the core.

Instructors should be allowed to choose their own materials. They are professionals with subject matter expertise and a unique understanding of their students. Administrators can help by raising awareness and providing support for OER through funding, professional development and training, and campus programs.

### Meet audiences where they are with different OER offerings.

There is no one-size-fits-all model for OER introduction, as stakeholders will have different levels of familiarity and expertise with resources. Providing different offerings can be a sustainable, engaging way to encourage OER adoption. For example, a flexible training system can introduce new instructors to OER as part of the onboarding process.

### Librarians, instructional designers, and administrators are critical OER stakeholders.

*Librarians* are important bridges between open access research and open education. They have expertise in managing copyright, hosting new materials, and finding OER in unexpected places. *Instructional designers* have expertise in education research, educational efficacy, and pedagogy. They can set the scaffolding for new learning materials. *Administrators* can influence priorities and pave the way for OER, setting the tone and agenda for standardization across schools.

### Use collaborative tools to improve responsiveness and remixability.

Online learning platforms supporting OER have recently added new features to engage communities in scaling up resources and materials. Open textbooks created and edited in wiki formats lead to responsive and remixable digital resources. Crowdsourced annotations convert structured files into interactive web-based textbooks. These collaborative, adaptive approaches help keep resources updated for the latest digital formats and devices.
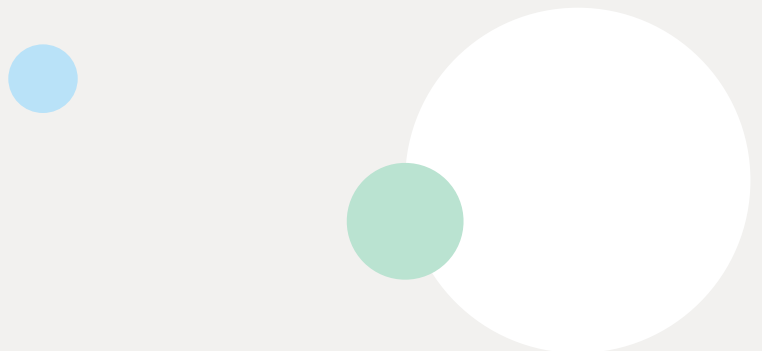
# Report Highlights: Multiplying Impact

In a 2018 survey, millions of American adults seeking new workforce skills said that they need better educational opportunities, but that most of the financial investments in educational technology have not addressed those needs.[12]

The creation and deployment of adaptable, accessible, and applicable edtech require more considered investment. In the second Power in Numbers report, "Multiplying Impact: Five Frameworks for Investment in EdTech for Adult Learners," we identified five opportunity areas for stakeholders who want to select edtech that will make the maximum impact.
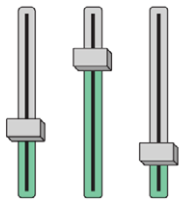
## Supplement the instructor

Adult educators face time constraints, including their own part-time status and the unpredictable schedules of their students. This results in classrooms where educators are unable to sufficiently personalize learning experiences for individuals with different backgrounds. Successful edtech enables educators to address the broad needs of their classroom by enhancing and supplementing crucial human interactions between instructors and learners.

Coursework in mathematics is often data-driven, which creates opportunities to automate processes, especially those that are tedious or nearly impossible to conduct manually. Automation enables faster access to quantified results, which helps educators focus their efforts. For example, *live assessment tools* and *AI-enabled grading* aggregate and analyze data, drawing out key insights for instructors to provide tailored, in-the-moment guidance to individual students and the class.
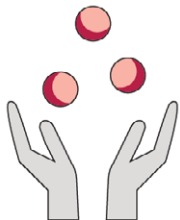
## Design for life

Adult learners are often balancing class attendance with work schedules and family responsibilities. Edtech should account for learners' lives and reduce friction in attendance. Distance learning can connect learners with the resources they need, primarily through media and technology, regardless of space or time.

Online communication channels allow instructors and learners to connect virtually. Mobile tools can help busy adults make time for learning when they're not sitting at a desk. Features like *text reminders* offer "digital nudges" to remind learners and educators to meet their obligations and complete their assignments.

## Engage the learner

Unlike children, adult learners must actively choose to participate. Technology must capture learners' attention, then retain it. Tools should be designed to help learners connect concepts to personal goals. To mitigate risk of attrition, solutions should address the entire user experience, from adoption to retention.

Edtech can take inspiration from consumer technologies that engage users. Games can enhance learning by increasing time spent on tasks, maintaining motivation, and encouraging self-regulating activities.

*Family-friendly interfaces* support adoption and inspire further learning by integrating seamlessly into the lives of adult learners. Learning can become a family activity, increasing motivation and relevance for adults and modeling education practices for children.

### Build the community

Social-emotional memories of a learning experience facilitate continued and longer-lasting learning. But with the increase in distance learning, the loss of an in-person collaborative environment can lead to feelings of isolation. To combat this, technology can foster community through direct collaboration or by facilitating indirect interactions. Collaborative learning enhances motivation as students become invested in the group, creating a network effect.

Websites that are open and community-run provide democratized, free platforms for learning. *Community forums*, including Q&A message boards, social network groups, and group chat tools, are easy ways of creating an online network and community. Wikis are open-source websites that serve as repositories for program or class-related information, while doubling as content creation tools.

### Connect the dots

Resources need to connect to learners' personal contexts, in life and at work. Through contextualization, math becomes more than just math — it's a way for adult learners to help their children with homework, maintain personal finances, or manage family budgets.
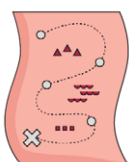
### Implications

*Open data* from real-world sources can have a huge impact when integrated into math lessons and edtech tools for adult learners. Datasets, which can include job applications or apartment listings, transform a problem into one that is relatable to learners and the real-world challenges they face.

Although technologies are changing the adult education landscape, there are also challenges. For example, digital literacy and access are not guaranteed, and distance learning can lead to isolation. Considerations that stakeholders should take into account to develop and deploy them thoughtfully include:

- Tools must support, not replace, educator-student interaction and be balanced with substance.

- Decisions on what technology to adopt must consider implementation timelines and upfront costs.

- Developers should work collaboratively with the larger community of stakeholders, including educators and industry, to create and curate relevant content for learners.

- Interoperability paves the way for integration, so technology and data are not siloed and inflexible.

**Read the full report, "Multiplying Impact: Five Frameworks for Investment in EdTech for Adult Learners."**

# Case Study: How Employment Technology Fund is Investing in Adult Learning

### Project and goals

Employment Technology Fund (ETF@JFFLabs) is a U.S.-focused impact investing fund committed to removing employment barriers that result from skills gaps and mismatches. ETF@JFFLabs aims to enhance opportunities for millions of underemployed Americans.

ETF@JFFLabs has identified four areas for early-stage companies targeting the workforce technology market: learning and training, mentoring and support, job search and placement, and assessment and matching.

*"Adult learning is lifelong learning. Given disruption in technologies and the changing workforce — like automation and artificial intelligence — a degree or single training course is no longer enough. We should be investing in tools that allow for continuous education and upskilling of adults throughout their careers, and provide adults with the credentials or other signals to the market that they've acquired these skills. We aim to make the most underserved adults in the workforce more marketable."*

**Yigal Kerszenbaum, Managing Director, JFFLabs**

### Actions and approach

ETF@JFFLabs provides catalytic capital to entrepreneurs, often as the first institutional investor. As its portfolio companies are usually early-stage and resource-constrained, ETF@JFFLabs supports them with technical assistance to facilitate growth. This includes building governance and financial strategy , as well as getting products in the hands of early users and customers.

Early-stage companies frequently lack the means to conduct user testing. Additionally, low-income adults, the target demographic of ETF@JFFLabs' portfolio companies, are often hard to reach. In partnership with The EdTech Center at World Education, ETF@JFFLabs is piloting a user-testing program that connects companies' products and services with this target demographic for evaluation and feedback. This provides invaluable data and information to companies trying to figure out what works and what doesn't; companies can iterate and design user-centered products that are more effective, efficient, and impactful.

### Results

To date, ETF@JFFLabs has invested in seven portfolio companies, ranging from mobile solutions for adult learners to a digital literacy assessment program.[13]

**Cell-Ed** is a mobile platform for micro-lessons that can be completed on a flip phone, smartphone, or computer. Learners are also assigned a coach who is available by phone for questions and troubleshooting. Since launching in 2014, Cell-Ed has logged 1.5 million minutes of training and 1.6 million texts. The platform has 800,000 users and expects to reach more than 1 million users by the end of 2019.[14]

**SignalVine** is a software and mobile technology company with a two-way messaging platform for higher education stakeholders. Its enterprise solution nudges students, educators, and staff towards better learning behaviors. SignalVine is used by more than 1.7 million students and 200 higher education institutions and colleges, including New York University, University of California San Diego, and the University of Texas at Austin.[15] ETF@JFFLabs is working with SignalVine to replicate their higher education success with workforce development boards, starting with entry-level and front-line retail workers.

**NorthStar** is a digital literacy assessment for basic skills. Online, self-guided modules assess the ability of individuals to perform tasks on computers and online. NorthStar has conducted more than 3 million assessments and awarded approximately 21,500 badges, and is used by more than 600 Adult Basic Education programs, colleges, nonprofits, workforce centers, government agencies, and businesses.[16]

## ETF@JFFLabs' learnings
ETF@JFFLabs shared the following lessons from their experience.

### Edtech platforms should address multiple user needs.
Adult learners often do not want to buy or use more than one product to accomplish various goals. Users value the convenience, accessibility, and (often) affordability of tools that do more than one thing. In addition, edtech developers will find increased market opportunities and more sustainable, attractive business models through diversification. For example, CareAcademy, an ETF@JFFLabs portfolio company, is a learning and training company that has assessment and credentialing built in.

### Meet adult learners on their own terms.
Lower-income adults may not be able to consistently go into a classroom or testing center. Flexible education reaches users where they are. For example, someone waiting at a bus stop between shifts can benefit from portable solutions on handheld devices. One-third of Americans do not have access to broadband internet at home,[17] so mobile solutions can help reach these underserved users. Emerging technologies like 3D virtual or augmented reality can enhance accessibility if incorporated into products to provide a simulated, interactive learning environment that users can access from the comfort of their own homes.

**Defining metrics from the outset is critical for good edtech design.**
Multiple types of metrics can be used to inform the iteration and design of user-centered products. A best practice is to standardize and regularly collect data on impact and operations. ETF@JFFLabs develops and uses impact metrics to measure companies' performance based off its mission to close the employment opportunity gap. These include demographic and user engagement metrics. ETF@JFFLabs' operational metrics measure each company's financial and operational goals, like profits and market share. Operational metrics should be well-aligned with impact metrics, as they correlate: Both the success and failure of the company depend on how many users it impacts.

### USER TESTING INSIGHTS FROM ETF@JFFLABS AND WORLDED

When piloting its user-testing program with WorldEd, ETF@JFFLabs learned that effective tools have a few things in common. These characteristics map closely to the investment areas explored in the second Power in Numbers report:

- **Design for life through mobility and accessible onboarding**: Mobile technologies increase access to learning and critical employment opportunities; the best tools understand users' communications preferences and provide multiple ways to access content. In addition, simple, accessible onboarding — for example, eliminating registration requirements — leads to larger-scale use among adults with lower digital literacy or basic skills.

- **Engage the learner through rich media**: Rich and diverse media, like videos, audio, photos, and other instructive graphics, can be more engaging than text, especially for users with limited literacy or English language proficiency.

- **Build the community through personal connections**: Integrating personal connections, like human coaching and access to industry experts through chat, supports user engagement in tools. Additionally, virtual tools can complement in-person learning and coaching.

- **Connect the dots through** "**screening in**": Rather than screening out populations, screening in is bringing the right opportunities to overlooked populations through competency, experience, and attribute-based assessments.

To learn more about these findings, read the report, "Leveraging Technology to Increase Opportunity and Economic Security for Adults."

# Report Highlights: From Creation to Adoption

Successful adult edtech depends not only on the quantity of products and services but also the quality. Investment in edtech is on the rise, and more tools are available, but many are not scalable and do not fully meet the needs of adult learners or educators. One main reason is that key stakeholders are disconnected from each other, leading to a disjointed development and deployment process.
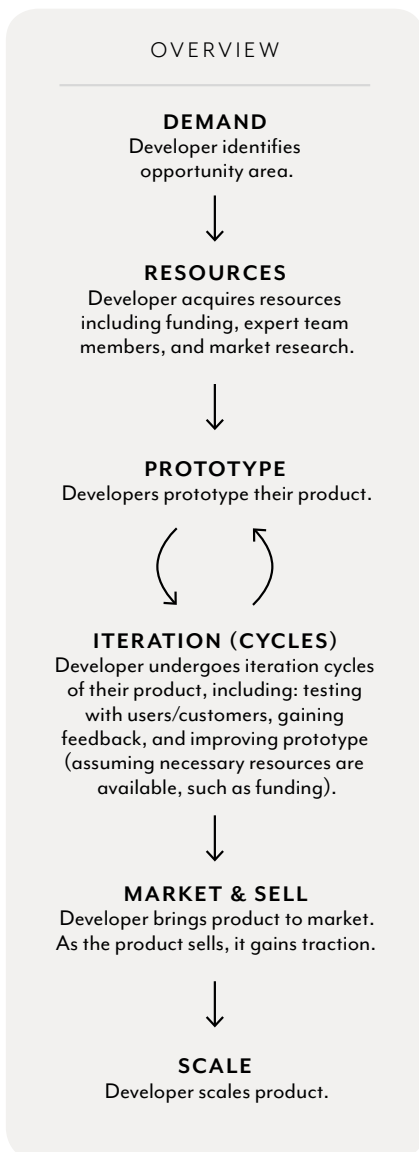
In the third Power in Numbers report, "From Creation to Adoption: How to Develop and Deploy Successful Edtech," we charted three common pathways of edtech development and deployment. Deconstructing and analyzing these pathways can help stakeholders identify what an ideal product development and adoption pathway could look like, to the benefit of adult learners. Stakeholders who are decision makers can use these pathways as a blueprint to improve their processes and outcomes for adult edtech development.

## Pathway 1: Edtech developer identifies a problem and devises a solution

In this pathway, the edtech developer centers the solution around a problem they have identified. After acquiring resources and researching the market, the developer creates a prototype. The developer makes iterative improvements before bringing the final product to market, where it is sold to administrators for classroom integration by users.

*Key challenges:* Funding and timeline limitations can obstruct creation and distribution. Developers are selling their prototypes to administrators, as well as to funders and experts who provide critical resources. Breaks in communication between various stakeholders inhibit product design, sales, integration, and scalability.

**Recommendation: Developers should engage users throughout development to generate scalable solutions.**

### OVERVIEW

**DEMAND**
Developer identifies opportunity area.

↓

**RESOURCES**
Developer acquires resources including funding, expert team members, and market research.

↓

**PROTOTYPE**
Developers prototype their product.

**ITERATION (CYCLES)**
Developer undergoes iteration cycles of their product, including: testing with users/customers, gaining feedback, and improving prototype (assuming necessary resources are available, such as funding).

↓

**MARKET & SELL**
Developer brings product to market. As the product sells, it gains traction.

↓

**SCALE**
Developer scales product.

**IDENTIFY PROBLEM**
User identifies problem without a purpose-built solution.

↓

**IDENTIFY TECH**
User identifies a technology with suitable features, which is then repurposed for their needs.

Key features for which the user evaluates are:
- Free or cheap?
- Open source?
- Easy to distribute and remix?

↓

**PRODUCT SCALES**
Scaling typically happens when users share through word of mouth in their communities of practice.

## Pathway 2: Users who lack tailor-made solutions hack their own

In this pathway, users who have a problem and no solution turn to repurposing existing technologies beyond their intended purpose. For example, educators may mix existing technologies like Microsoft Word and Google Chromecast in their classrooms to fit their specific needs. When enough educators repurpose the same pre-existing tools to solve similar problems, it becomes common practice.

*Key challenge:* Users settle for existing technology created for other purposes by developers and are dependent on administrators' support, but are often excluded from purchasing and scaling conversations.

**Recommendation: Developers should design for outliers to enable more universal use of products across multiple use cases.**

OVERVIEW

**IDENTIFY TECH**
Developer identifies technology.

↓

**IDENTIFY MARKET**
Developer sources market/audience to expand technology.

↓

**CREATE TOOL**
Developer creates product or tool.

↓

**MARKET**
Developer brings product to market. Developer then gets buy-in from customers (administrators).

↓

**SCALE**
Developer scales product.

## Pathway 3: Developers create a solution, then source the market

In this pathway, developers start with the technology solution and retroactively source the market. Developers sell their solution to administrators but neglect to consider significant stakeholders like users.

*Key challenge:* Starting with the solution excludes users and fails to address the problems and needs of educators and learners.

**Recommendation: Start with the problem, not the technology, to create solutions with a purpose.**

These pathways show that it takes a connected community to develop and deploy successful edtech: Traditional adult education stakeholders like administrators, educators, and learners, as well as developers, employers, and funders, all play a critical role in effective edtech development.

Through this analysis, we determine key actions stakeholders can take to improve outcomes:

- **Developers** can shift from occasional to long-term user engagement throughout the product development process.

- **Employers** can engage in the creation and classroom integration of tech tools.

- **Administrators** can seek out research and data in adult edtech efficacy to inform purchase decisions.

- **Educators** must receive professional development to effectively integrate tech tools.

- **Funders** can collaborate with employers to sponsor adult edtech tool development that addresses skills gaps in the workforce.

**Read the full report, "From Creation to Adoption: How to Develop and Deploy Successful Edtech."**

# Case Study: How Project COMPASS is Customizing Online Courses for Adults

## Project and goals

Wake Tech Community College is the largest community college in North Carolina.[18] Its community includes a significant number of minority students, many of whom are enrolled in online courses.

Through the Department of Education's First in the World Grant, Wake Tech is piloting Project COMPASS, a "completion by design"[19] project for high-demand courses with a focus on supporting students of color in achieving stronger performance. The goal is to develop and test an equitable model that improves student success, performance, and completion while adhering to the Southern Association of Colleges and Schools Commission on Colleges accreditation standards.

## Actions and approach

### Wake Tech's high-tech, high-touch model

The Project COMPASS leadership developed a strategy that they termed the high-tech, high-touch model. This model, which Wake Tech is piloting, emphasizes social engagement and interaction between instructors and students, and the **use of technology with a purpose**. High-tech, high-touch teachers use three technologies designed to increase familiarity and interaction among teachers and students:

- **Instructor-created videos**: Learning is a supported process, and instructor videos help create a meaningful, warm relationship through communication that captures verbal and facial cues. Wake Tech has an on-campus studio where instructors can go to create high-quality videos for their courses.

- **Secure texting tools**: Instructors can easily provide information and feedback to students via text. Open communication and timely responses help close the distance between learners and instructors.

- **Virtual meeting software**: Many students prefer to learn in a social context where they can meet one another, share ideas, and collaborate. Virtual meetings provide an opportunity for synchronous interactions.

To complement these technologies, instructors receive sensitivity training to enhance awareness of minority students' needs.

Three online classes — Introduction to Psychology, Business, and Computers — are part of the pilot. These "gateway courses" represent in-demand introductory classes with large achievement gaps, especially among minority students.

*"I've been a teacher for the past 14 years. In 2007, I had an illness that forced me out of the classroom, and I had to teach online for an entire semester. I realized that online education can be an alienating experience. This wasn't acceptable to me, and I set about applying technologies and tools that can help fight this particular alienation. I developed Project COMPASS not just to make all students' learning experiences better, but to make myself and other educators happier."*

**Chris Ron Miller, Associate Professor of Psychology, Wake Tech Community College; Instructor and developer, Project COMPASS**

## Results

Results from the first two classes to complete the pilot — Introduction to Psychology and Introduction to Business — show a significant impact on student success. Minority students improved their course performance by 11 percent, and a community of inquiry survey[20] showed positive perceptions of the model by students.[21] Students were impressed by the instructors' responsiveness, concern, and care. This increased engagement correlated with moderate improvement of students' course persistence.

Instructors provided data and feedback on the implementation of the model several times throughout the process. Instructors said the model changed their workflow but didn't add to their workload; it freed up time to focus on the content, rather than delivery. Many instructors continued to use new techniques and tools after the study ended.

Wake Tech has used these findings to inform the development of online teaching standards, regular training programs, and a 30-hour professional development certification for all online faculty members. They plan to apply the high-tech, high-touch model to additional content and disciplines, starting with other gateway courses.

## Project COMPASS' learnings

Project COMPASS leadership shared the following advice from their experience.

### Focus on the end user, not the product.

Many edtech companies focus on building an exciting technology product and selling it to administrators and educators — often without adequate user research to demonstrate the ability to achieve outcomes. A better approach is to start with users' needs and goals, and adapt readily available technology to meet those needs where possible. Alternatively, instructors can apply a deep understanding of their students to the development of their own edtech tools.

### Provide multiple solutions to reach the same goal.

Online courses are popular among students who can't be in a specific place at a specific time. Adding mandatory meetings to courses can impact student attendance. Instructors can provide students with multiple options for interacting. Instead of making sessions and meetings mandatory, students can choose from different avenues and activities — from participating in online discussion boards to attending virtual office hours — depending on what fits their preferences and lives outside of college.

### Build an inclusive campus life for minority students.

Students from minority communities may experience feelings of isolation if educational systems do not reflect their experiences. Schools can focus on making classrooms and campus life more multicultural and representative of their students. For example, videos and other imagery reflecting minority speakers and interests help students see themselves on campus and in courses.

### Learnings from the virtual classroom can be applied to traditional courses.

Insights from virtual programs can be applied to improve the experience in traditional classrooms. Whether virtual or in-person, enhancing the relationship between teachers and students creates a more diverse, equitable community that champions student performance and learning.

**IMPACT SPOTLIGHT**

To support an inclusive and welcoming community spread across six campuses, Wake Tech began livestreaming a show featuring diverse community leaders who represent minority groups. Students could engage with and ask questions to these role models through livestream chat features, and videos could be easily recorded with little post-production. The popularity of the show led to the development of an entire virtual campus, **Wake Tech's Eagle Stream**, that now hosts extracurricular events and activities ranging from arts to sports to education.

# Looking Ahead: Mobilizing Stakeholders in Adult Education

Since Power in Numbers launched in 2016, substantial progress has been made to enhance advanced mathematics teaching and learning through edtech.

In 2018, U.S. edtech companies raised $1.45 billion, marking a steady increase in dollars invested since 2011.[22] Awareness of OER has also increased, with the use of open textbooks nearly doubling from 2015–16 to 2016–17.[23]

Power in Numbers reports have featured key insights to drive this progress for adult learners. Each report has highlighted new learnings from a diverse set of stakeholders, including case study interviewees, subject matter experts, and educator user groups, with a common — but powerful — thread across all three reports:

**Advancing adult mathematics and education requires collaboration. Key stakeholders — including administrators, funders, educators, learners, developers, and employers — must work together toward a common goal.**

The case studies outlined in this fourth and final report showcase a few examples of how adult education stakeholders have successfully developed and deployed edtech initiatives and solutions. Their stories can inspire and mobilize stakeholders to create their own innovative programs.

With these insights and a collaborative community of support, stakeholders can open doors to further adult education and training, significantly increasing employment opportunities and long-term career options.

## Additional resources

- Power in Numbers. The initiative's online hub, which includes OER developed by educator user groups, links to reports and newsletters, and information on subject matter experts.

- LINCS Learning Portal. Freely available, evidenced-based online courses and training for educators and program managers. For each course completed, users receive a downloadable certificate of completion.

- LINCS Community. A moderated discussion forum where groups of adult educators, program managers, and professional development experts worldwide discuss important topics and share resources.

- OER Commons. An accessible online library that allows teachers and others to search and discover OER and other freely available instructional materials.

# Endnotes

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