From Creation to Adoption: How to Develop and Deploy Successful Edtech
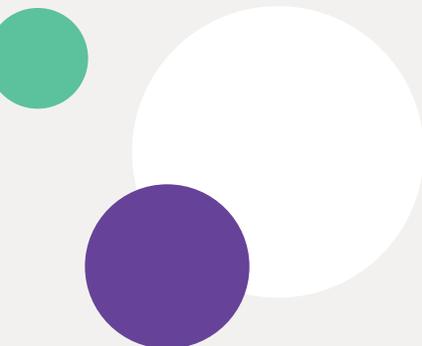
Power in Numbers
Advancing Math for Adult Learners

LUMINARY
LABS

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Acknowledgments

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

The challenge:
not just quantity, but quality

In two previous reports — _The Math Gap: Implications for Investing in America's Workforce_ and _Multiplying Impact: Five Frameworks for Investment in EdTech for Adult Learners_ — Power in Numbers made the case for developing educational technology (edtech) for the largely untapped adult education market. Existing adult learner populations and programs are currently underserved by the broader edtech market, with few tools customized for or employed in adult classrooms.[1]

In addition to the shortfall in edtech resources, an equally daunting challenge for adult education is enhancing the quality and impact of the current tools. Current edtech tools are not fully meeting the needs of learners or educators. This is due to market inefficiencies and a lack of collaboration between key stakeholders.

Education stakeholders — including users, developers, administrators, funders and employers — would benefit from addressing these critical problems. The right edtech tools can play an instrumental role in achieving stakeholders' shared goals: reskilling adult learners and closing the skills gap. The changing nature of work means that reskilling is top of mind for employers, with many turning to internal retraining programs to match employees' skills to their business needs.[2] A 2018 World Economic Forum report survey of OECD countries found that "more than one in four adults reported a mismatch between their current skill sets and the qualifications required to do their jobs."[3]

This report explores the steps that stakeholders must take to address the challenge of developing quality and impactful edtech. The analysis examines the core components of the adult edtech market, including the process of product development and deployment, and the stakeholders that guide it. We highlight key actions that stakeholders should take to improve adult learning outcomes.

By the numbers: adult edtech is a small slice of investment and spending

While the edtech market is large, growing, and attractive to investors, a significant market subset has largely been overlooked: the adult edtech market. U.S. edtech venture funding grew by almost 20 percent in 2017 to $1.2 billion.[4] Over the past decade, this market has been dominated by postsecondary edtech companies. Yet the size of the adult education segment appears underrepresented when compared with its market potential in terms of both scale and investment.

The size of the potential adult learner population is vast; more than 36 million adults in the U.S. have low levels of skill attainment, and nearly 25 million lack a high school credential.[5] Despite the evident need to reach a broader population more effectively, only an estimated 2 percent of adult education services spending is currently allocated toward education technology.[6] Fundamentally, there is a lack of high-quality and scalable edtech solutions that cater directly to this underserved population of learners.
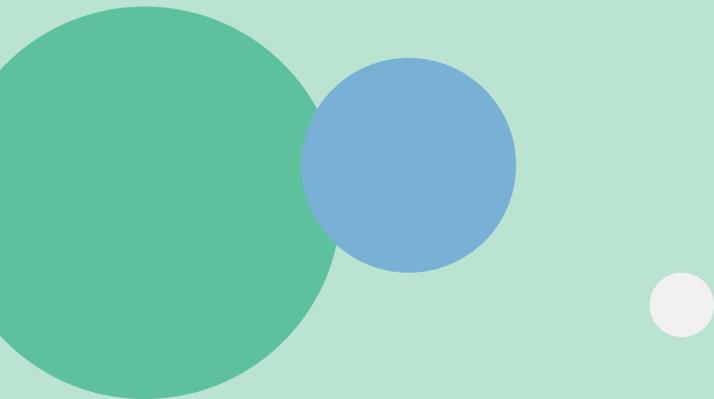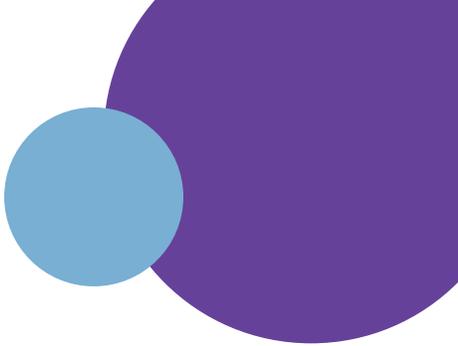
Breaking down the problem: adult edtech needs recalculating

We examine the process of edtech development and deployment, as well as the people and organizations involved. The path and the stakeholders in it concurrently determine the outcomes achieved with adult edtech tools. Through this analysis, we identify critical junctures in the process and the key steps stakeholders should take to create greater impact.

The development and deployment process is disjointed

Through discussion with adult education subject matter experts and educators, Power in Numbers has identified the most typical pitfalls in the product development and deployment process. We examined the steps — from initial idea to classroom use — and identified where the process most frequently breaks down. In the sections that follow, we map the most frequent routes for edtech to enter the adult classroom, which we term "product pathways." We explore how the development and deployment strategies differ in each product pathway, and the impact on outcomes for learners. We assess how critical stakeholders could more effectively support the success of adult edtech products. Our analysis points to key process changes that may increase the quantity and quality of adult edtech tools entering the market.

Key stakeholders are disconnected

Edtech products live and die by the decisions and actions of several key stakeholders described below. The pathways analysis that follows unpacks where key stakeholders are excluded or under-involved. If these stakeholders can collaborate more effectively, they can bring higher-quality adult edtech products to this underserved market.

Stakeholders

Developers Education and technology companies that produce edtech tools.	**Administrators** Decision-makers who buy edtech tools.	**Employers** Companies that hire adult learners and define relevant skills for employment.
Funders Investors who fund the production of edtech.	**Users (Learners)** Student learners who use edtech tools.	**Users (Educators)** Educators who use edtech tools.

Making connections can change the equation

Stakeholders must address several friction points along this product pathway if they want to see more and better adult edtech tools in the market. We provide recommendations for improvement, including:

- **Greater two-way engagement** between **developers** and **users** during the adult edtech development process, emphasizing long-term relationships or partnerships rather than the single-transaction interactions that dominate the current market.

- **Employers** engaging in the **creation and classroom integration** of tech tools to improve their own hiring pool and align curriculum with workforce needs.

- **Funders, developers** and **administrators** providing readily available and free **professional development** for **users**, particularly educators, to support necessary adoption and integration of tech tools.

- **Funders and developers** sponsoring and conducting more **research and data collection** in adult edtech efficacy to support **administrators** in their purchasing process and **educators** in their selection process. This includes collecting feedback from existing sources such as educator communities of practice.

Deconstructing the edtech path
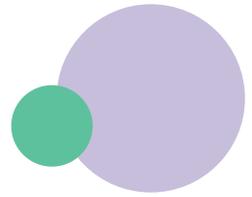
To understand how adult edtech market failures occur, we illustrate how tools are brought to and implemented in the marketplace. The experts we consulted agreed there are multiple product pathways and three are the most archetypal. These typical paths broadly account for the range of classroom situations and circumstances that impact technology adoption.

We explore the first product pathway in the most detail, as it prioritizes learners by targeting a specific adult education need. The second and third pathways represent technologies that are not built specifically for adult edtech, but are nonetheless adopted into the adult classroom. In the second pathway, educators driven to solve adult classroom challenges "hack" together solutions, repurposing non-education resources to serve their needs. In the third pathway, the impetus is commercial; a developer looking for an adjacent market opportunity redeploys their technology with little to no modifications.

These different pathways are led by different stakeholders — each of whom can play a role in achieving better outcomes for adult learners. At each step on these pathways, there are key decisions to be made, fellow stakeholders to consult, and opportunities for success or failure. Here we will discuss how each stakeholder can communicate and interact more effectively.

OER are best when purpose-built, but are designed for easy repurposing

Open educational resources (OER) are a subset of edtech that have great potential within adult education, as discussed in our prior reports, _The Math Gap_ and _Multiplying Impact_. OER development and deployment are unique in that they straddle pathway 1 and pathway 2.

Many OER are built for a specific purpose — they are created by educators for specific classroom needs or to deliver specific content. An open educational resource's first iteration, therefore, follows pathway 1. However, the majority of OER are adapted, reused and repurposed — ultimately following pathway 2. The versions of OER used in many classrooms are not the original resources, but have been adapted by educators to meet or approximate their needs.

Too often, adult educators are forced to repurpose OER that were designed for K-12 education. This presents issues for adult learners, who need to learn about problems and concepts in contexts that are relevant to adult work and life experiences. These are different than the contexts in which children learn math.

Power in Numbers has worked to shift this balance and increase the quantity and quality of adult-appropriate, purpose-built OER through our _teacher user group program_.

Pathway 1:
Engage users end-to-end 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 the 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.

The Catalyst

A problem in adult education inspires a **developer** to create a new edtech product.

The Pathway

Typically, the **edtech developer** identifies a problem and devises a solution. After acquiring resources (e.g., funding, team) and researching the market, the developer creates a prototype. The developer then tests the prototype and makes iterative improvements before bringing the final product to market, where it is sold to **administrators** for classroom integration by **users**. While this pathway presents the strongest opportunity to directly address adult learner needs, most products in this pathway face funding or timeline limitations that can obstruct creation and distribution.

Key Challenges

Throughout this process, breaks in communication between various stakeholders inhibit product design, sales, integration, and scalability.

KEY STAKEHOLDERS

○ Enters pathway

— Very involved

- - - Somewhat involved

EDTECH DEVELOPERS

USERS (EDUCATORS)

USERS (LEARNERS)

ADMINISTRATORS

FUNDERS

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 the 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.

Key Challenges (Continued)

1. Developers' and funders' expectations and timelines are not aligned.

Edtech go-to-market timelines tend to be longer than the average digital product. Reimagine Education's white paper on edtech investment and venture capital said, "digital transformation in education, although a powerful trend, is five times slower than in other sectors undergoing a digital transition."[7] Edtech startup sales cycles are long and slow, which means funders do not see a return on investment quickly.[8] While funders demand fast proof of efficacy, developers need time to collect and provide relevant data. In adult education specifically, the lack of regular or consecutive classroom hours[9] makes this conflict more pronounced.

Funders' desire for fast results naturally conflicts with developers' need for time to organically increase adoption. Growing from early adopter stage to mass adoption stage requires time and iteration. "Early adopters will tolerate 'glitch' software but the busy teacher, rushed administrator, or easily distracted student will not. An edtech startup can gain initial traction and proof of concept, but if they can't quickly progress to a smooth user experience, they'll lose momentum."[10] Ultimately, without adequate funding, developers will not have time to iterate to the near-perfect results that drive seamless adoption. Therefore, it becomes critical to address the disconnect between funders' expectations and developers' realities.

Achieving scale: the challenges of limited data and financing

Gaining traction and scaling is where many tech solutions fall down on this product pathway. Often, edtech developers must choose between short-term and long-term approaches.

- **Short-term approach.** Bootstrapped developers achieve immediate impact through recognition and grassroots marketing — often with help from early adopters, thought leaders, influencers or paid partnerships. This short-term growth sometimes comes at the expense of the research and/or efficacy studies needed to parlay burgeoning interest into a wider customer base.

- **Long-term approach.** Developers can promote data-based decision-making and engage in efficacy studies to secure long-term buy-in. The key obstacle is financing; efficacy research can be time-consuming and expensive. Edtech companies with limited financial resources do not have the luxury of this time.

Key issue: translating early adopters or influencers into a customer base.

- In edtech, the customer and the user are usually not the same person. Reaching influential teachers or early adopters is often just the first step.[11] There is no guarantee that the institutional customer (typically an administrator) will follow suit. Broad institutional adoption often requires proof of scalability and efficacy across a faculty, a department, or even an entire institution.

2. Lack of user engagement leads to tools that don't suit classroom needs.

User-centered design can be defined as "an iterative design process in which designers focus on the users and their needs in each phase of the design process."[12] Too often the needs of users — whether students or educators — are ignored because they are not at the top of the edtech hierarchy.[13] Administrators make purchasing decisions, while teachers often decide which free tools to use.[14] A holistic approach would consider feedback from learners and educators before engaging with administrators.

3. Administrators lack research and data to inform purchasing decisions.

Different types of research approaches can inform edtech decisions. Market research that shapes the initial design, iteration, and early customer conversion of the tool is often disconnected from subsequent efficacy studies that examine a tool's educational outcome.

Market research can include methods like keystroke data analysis, classroom observation and student outcome comparisons.[15] These can be inexpensive and appealing to both administrators and developers, but they cater to a short-term scaling approach that is often unsustainable. These activities do not drive retention and long-term outcomes.

Lengthy and expensive research is required to produce evidence of **efficacy**. Furthermore, data collection is a challenge for all edtech developers, particularly regarding the impact of specific tools on test scores. In adult education, measuring impact becomes especially complex because of mixed-ability classrooms. How do you judge progress in a classroom with multiple baselines? The absence of data combined with the lack of consensus on measurement poses a challenge for developers.[16]

4. Limited communication between administrators and users results in decisions that do not reflect the needs of end users.

Communication with users before, during and after choosing a technology can help administrators identify and implement the best classroom solutions. Yet collaboration is not currently the norm. Communication challenges stem largely from logistical and financial barriers.

Administrators do not communicate with users before selection.

Edtech decision-makers often source relevant information from immediate colleagues.[17] In one study on edtech information gathering, nearly all interviewed administrators sought feedback from peers at their own institution, from vendors and from professional associations.[18] Unfortunately, administrator peer groups do not always include users (educators and learners).

Administrators and users lack adequate implementation support.

According to a group of higher ed administrators, "selecting edtech is the easy part of acquiring new technologies — the hard part is the change management needed for successful implementation and the provision of ongoing training and support."[19] Failure to provide professional development on how to use a new technology often leads to a significant lag in classroom adoption.[20] Lea(R)n Trials found that 37 percent of purchased online literacy and math program licenses were never even activated. Of the 63 percent that were activated, only 5 percent of users reached all of the purchaser's target usage goals.[21] Part of the usage gap stems from an educator training gap. As one educator noted, "There are times I want to speak with developers of [content] when I do not understand a sequence of events or am unable to use [the prescribed tools]."[22] To ensure effective use, well-designed and implemented professional development must be a core consideration in the design and procurement of edtech tools.

Users rarely have a chance to provide feedback after technology is selected.

Feedback from schools is challenging to collect. Patti Smith, Power in Numbers SME and former CMO of Querium, said schools are resistant to providing data because they believe a technology evaluator will disrupt the classroom.[23] Even if technology developers were granted access to adult classrooms, data collection remains challenging, as inconsistent attendance from session to session creates data consistency issues.[24]

Organizations like EdSurge have taken important steps to increasing interaction between end users and the edtech community through product reviews, events and webinars.[25]

5. Developers rarely consult employers, limiting the potential impact of products.

Learners today desperately need the right tools and training to adapt to the ever-evolving job market. The Business Roundtable, an association of U.S. CEOs, voiced concern over "a lack of individuals with fundamental employability skills, such as the ability to use basic math" in their 2016 survey. While employers are sponsoring programs at colleges, universities, and private training providers, forecast skills gaps continue to loom large.[26] Many experts have noted that there is still a lack of coordination between employers and educators.

As one MIT study summarized, the labor supply (workers and their skill investments) has yet to fully align with the demand side (employers and their skill requirements).[27] Edtech developers can play a key role in helping adult educators adapt quickly to market needs by ensuring that edtech content is relevant to both learners and employers.

Recommendations

Administrators

- **Seek out research to support purchasing decisions.** In the absence of research or data, look to testimonials and end user feedback.

- **Support necessary professional development** for users to maximize benefits of edtech.

Developers

- **Engage users early and often in the design process.** Design specifically for their needs and constraints.

- **Build long-term relationships** with users and administrators.

- **Support communities of practice** and give users an opportunity to share their experiences. This data can be just as valuable as lengthy and expensive efficacy studies.

- **Serve as the bridge between employers and users** by consulting with both to ensure vocational relevance of edtech tools.

Funders

- **Identify creative ways to help developers extend their funding resources.** For example, funders could free up resources by creating financial synergies by supporting multiple products simultaneously.

Employers

- **Serve as funders and collaborate with other funders** to sponsor developers addressing skills gaps in the workforce.

In addition to the purpose-built product pathway, there are two common alternative pathways. Pathways 2 and 3 look at alternative technologies that are not purpose-built for adult education, but are still used in adult classroom settings.

Pathway 2:
Design for outliers to enable universal use

OVERVIEW

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
Often because users will share through word of mouth in their communities of practice.

The Catalyst

Users (i.e., educators) who lack tailor-made solutions turn to hacking.
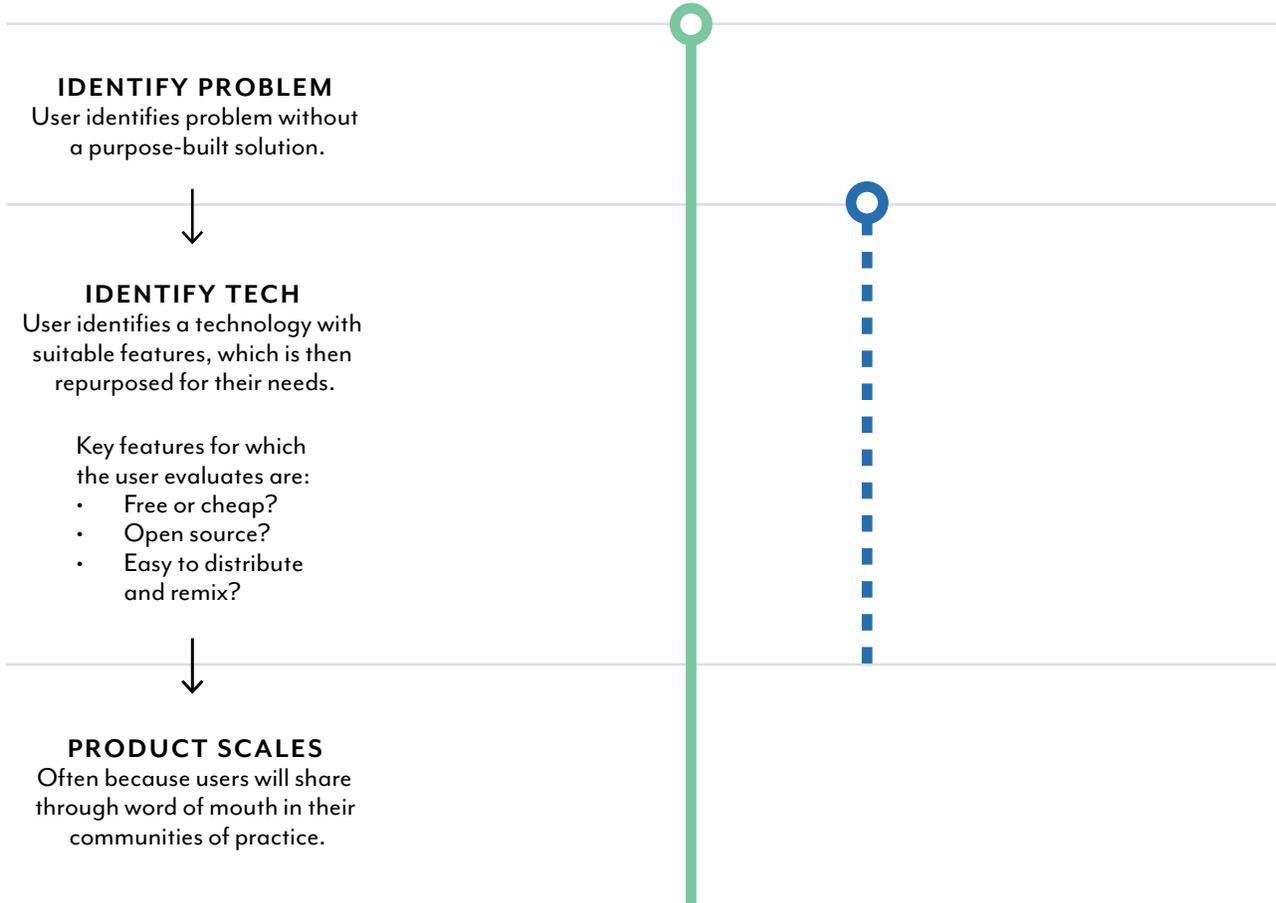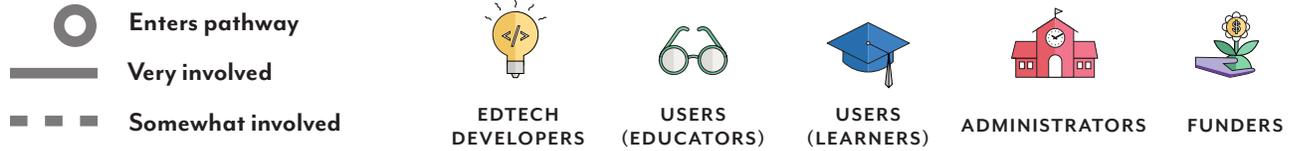
The Pathway

This product pathway necessarily starts with the **users** who have a problem and no solution designed to suit their needs. In adult education, typically the educator looks to solve a problem in their own classroom by mixing and repurposing existing technologies that were designed for a different purpose. For example, Microsoft Word might be used to draw equations and visuals for math lessons, or Google Chromecast might be used to stream OER media intended for a K-12 audience.[28] While this pathway affords educators the most ownership, it is also the most limiting, since they are settling for existing technology created for other purposes rather than relying on **developers** to design for them or **administrators** to buy purpose-built tools for them. When enough educators repurpose the same pre-existing tools to solve similar problems, it becomes a common practice.

Key Challenges

Without support from the administrator or interest from the developer, the user often lacks the resources to scale use of the tool or to customize it to their classroom needs. The inherent disconnect between those producing the technology and those defining its application means there is a built-in ceiling to what these tools can achieve. Users lack opportunities to convey their unique needs, as they are excluded from purchasing and scaling conversations.

KEY STAKEHOLDERS

○ Enters pathway
— Very involved
- - - Somewhat involved

EDTECH DEVELOPERS | USERS (EDUCATORS) | USERS (LEARNERS) | ADMINISTRATORS | FUNDERS

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
Often because users will share through word of mouth in their communities of practice.

Key Challenges (Continued)

### 1. Ad-hoc customization is limited without further training for users.

The limitations of repurposed solutions are difficult to surmount without customization capabilities. One educator described the trial-and-error experience of creating a graphical representation of numbers, called a "number line," in Word. She expressed desire for more control over formatting: "I wish developers of Microsoft Word and Google Docs would include the template of a whole number line" to save considerable time and effort when designing lessons.[29] Limited fluency in a technology amplifies these limitations. As one edtech entrepreneur noted, "Professional development [rarely] focuses on troubleshooting the technical 'how-tos' of a product."[30] If educators are repurposing business or commercial tools not necessarily designed for them, there may be no easy way to learn and use all the tools' applicable features.

2. Developers are not incentivized to serve non-core markets.

Power in Numbers SME and Desmos Chief Academic Officer Dan Meyer points out that it is neither productive nor profitable for many businesses to address individual or classroom-level needs. Write-in requests from teachers who are repurposing a technology are difficult and resource-intensive for developers to codify.[31] Therefore, teachers' wish lists remain largely just that. Even if educators suggest a universally helpful improvement (e.g., better search features), their requests largely remain unanswered.[32]

3. Users are left scrambling if features change or disappear.

Users who are repurposing tools to suit their needs suffer from the uncertainty of not knowing if tools or features will always be available.[33] Many products change with little to no notice to users; this presents risk in terms of data storage and long-term planning.
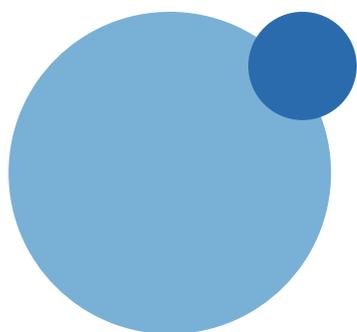
Recommendations

Developers and Funders

- **Embrace universal design.** Universal design is defined as "the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people regardless of their age, size, ability or disability."[34] Designing products that suit adult learner needs can produce universally better products that cater to a wider market's needs.

- **Offer support to non-core product users.** While edtech developers may not have capacity to fund or operationally support educator-led use cases for their technologies, they can support these movements in other ways. For example, supporting online communities of practice or professional development efforts can be low-cost yet impactful. If sunsetting products or features is necessary, developers should give users advanced warning and options for exporting and archiving data.

Case study: universal design driving adoption

OXO Good Grips kitchenware products are a prime example of universal design. Initially designed for people with limited dexterity, OXO's vegetable peeler appealed to a broader market because of its enhanced ergonomics.[35] Focusing on the needs of a limited or niche market led to a deeper understanding of consumer needs and constraints to be met.

The universal design concept should not be an afterthought, but should lead design thinking to better inform product design for a wider audience.

Administrators and Developers

- **Draw on communities of practice, both virtual and in-person, as sources of insight for the decision-making process.** These spaces fill critical gaps in adult education training and community, and should be sought-after sources of insight for developers and decision makers who want to better understand educators' needs.

- **Sponsor professional development to ensure non-core users fully understand technology solutions.** Adequate professional development can help educators to get the most out of technology solutions while providing valuable use cases and information to developers.

Case study: resourcing disparate educators

Adult educators are frequently more isolated than the average educators, particularly early in their adult education careers.[37] This is because they often lack formal teacher education, training and collegial support.[38] To help fill this training gap, Desmos launched Teaching Fellowships in 2015, which bring together math educators to benefit from early access to Desmos tools and activities while engaging in professional development in the community.[36] Such initiatives can empower educators and amplify the impact of their edtech tools.

Pathway 3:
Start with the problem, not the technology

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.
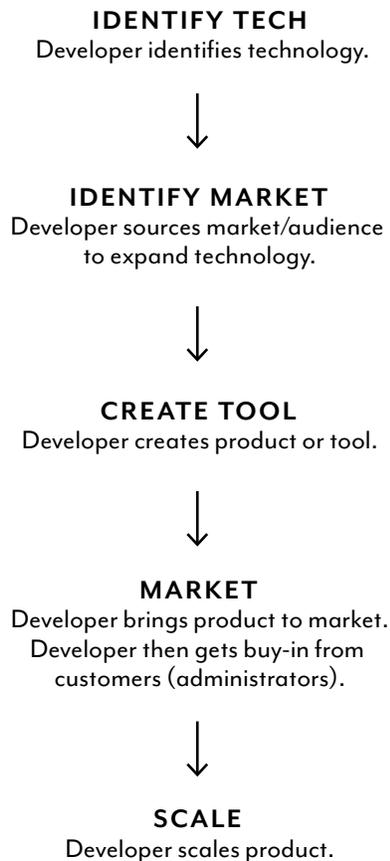
The Catalyst

New technology or an upgrade to existing technology motivates the **developer (i.e., product creator)** to expand into new markets.
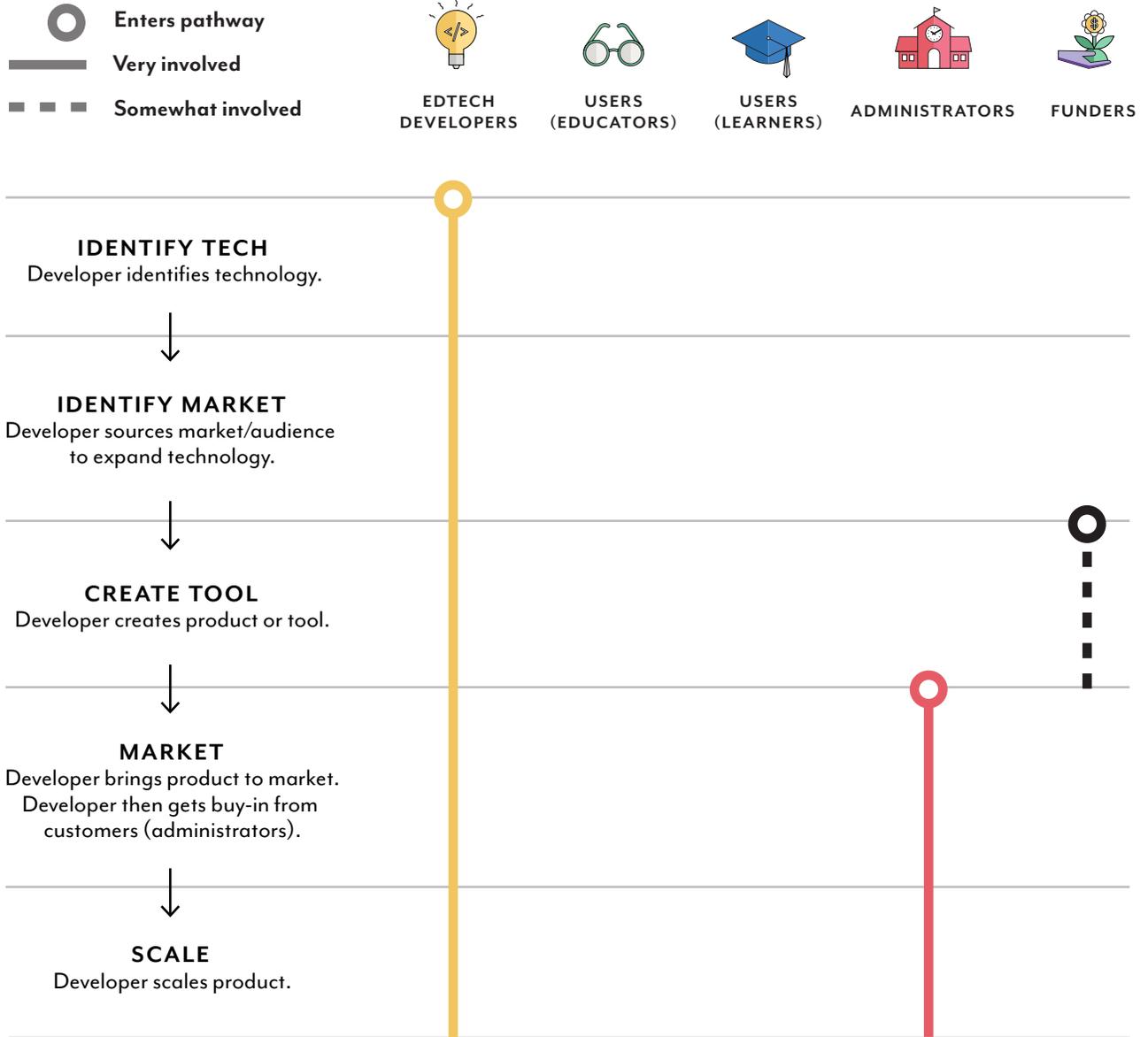
The Pathway

Many edtech tools find their way to classrooms driven not by a target problem or audience, but by the owners of the technology. Starting with the solution and sourcing the market is a cautionary tale that spans industries and has been prominent in edtech. This pathway often features relationships between **developers** and **administrators** but omits crucial connections in between. Significant stakeholders like **users** are excluded.

Key Challenges

Edtech, and edtech for adult education more specifically, is a challenging market for startups and tech companies. Many entrants fail when they try to retroactively apply their tech product to an education problem — a move that poses risks to business longevity (i.e., financial viability) and classroom longevity (i.e., pedagogical soundness). A product or service that was designed with a priority that is not the user, and that lacks thoughtful customization, is unlikely to truly meet educator and learner needs in the classroom.

PATHWAY 3: SOLUTION-BASED APPROACH

KEY STAKEHOLDERS

○ Enters pathway
— Very involved
- - - Somewhat involved

EDTECH DEVELOPERS | **USERS (EDUCATORS)** | **USERS (LEARNERS)** | **ADMINISTRATORS** | **FUNDERS**

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.

Key Challenges (Continued)

1. Developers do not recognize the contextual challenges to deploying new technology in adult education.

As we discussed in *Multiplying Impact*, the obstacles to new technology in the adult classroom are great. Limited and unpredictable attendance, variable internet access both in school and at home, and limited funding are all constraints specific to adult education. Patti Smith, Power in Numbers SME and former CMO of Querium, an artificial intelligence-enabled STEM assessment tool, emphasizes the importance of the "first hour of pleasure" in an edtech tool.[39] This first hour is critical in gaining buy-in from users and determining if they will engage with it long-term. In a classroom where attendance is less regular, this first hour takes on even greater importance, because the next interaction with users is not necessarily known. Therefore, poorly targeted new technologies face a higher risk of poor adoption.

In addition to usability issues, cost constraints can also be overlooked by companies unfamiliar with the education space. In one case study, a holographic imaging company attempted to pivot to education without modifying the product significantly. It remained too expensive and fragile for classroom use.[40]

2. Technology-driven solutions pose greater risk of harming users.

There are many cautionary tales of technology-driven solutions that have actually resulted in adverse educational outcomes for learners. One of the teachers we interviewed struggled with a photo-recognition app designed to scan students' handwritten math responses and auto-generate an answer. While the technology functioned smoothly, the responses provided no nuanced feedback to students, just an answer. This feature bypassed the constructive learning and feedback process and was ultimately discontinued.[41]

3. Administrators do not want to assume the risks of unproven technology solutions.

Adopting a new tool that is driven by either adjacent or emerging technology opens administrators up to risk, including financial risk and risk of unproven efficacy. Startups launching such products could either fail or pivot — and administrators cannot afford to assume that level of risk when making purchasing decisions for an entire program or institution.[42] In education systems with limited budgets, edtech adoption failures have significant negative repercussions.

Recommendations

Developers

- **Design for the specific and unique needs of the adult classroom.** Consult with users and be wary of hasty or overly simple product adjustments.

- **Define value proposition to administrators and mitigate risks.** Entering a new market naturally requires tailoring and an empathetic ear to both decision makers and end users.

Administrators

- **Be wary of technology-driven propositions.** It will be important to gain a full grasp of the risks and potential benefits. Continue to engage users — educators and/or learners — before final procurement decisions.

- **Thoroughly pressure test the value proposition of a new technology in the education space.** Inform funding decisions with relevant efficacy research on topics like user behavior and brain development.

Focusing on administrator engagement. A growing number of international organizations, including the International Society for Technology in Education, have published standards on classroom technology integration. These standards are directly aimed at administrators.[43] Early and direct engagement with administrators can drive adoption and lead to a shared sense of ownership between administrators and educators over successful technology integration.

Training new developers in Namibia. In 2016, the YouthMobile initiative launched in Namibia. It aims to facilitate greater quality and quantity of mobile applications entering the market by training new developers.[44] The program broadens the scope and sustainability of mobile app development by retooling and inspiring a new developer community and empowering them to design for need.

Ljubljana OER Action Plan. Representatives from 111 countries adopted the Ljubljana OER Action Plan following the second World Open Educational Resources Congress in 2017.[45] Furthermore, 20 nations signed a call to action for all education stakeholders to implement the plan's recommendations, which focus on developing supportive government policies and building capacity for OER use.[46]

Conclusion

We have broken down common edtech product pathways and assessed key areas of friction and opportunities for improving both products and outcomes.

When users are left out of the development and purchasing process, the impact of edtech tools falls far short of their potential. Tools selected solely by administrators often suffer from poor adoption and implementation. And when educators cobble their own solutions together, the repurposed tools hit natural limits in functionality and scalability.

To ensure that technology is meeting the true needs of adult learners, each stakeholder should prioritize several key actions. These actions can create the most immediate and far-reaching impact for users.

Call to Action

Developers

Small investments in stakeholder engagement can have an outsized impact on product success. We recommend developers prioritize two actions:

- Facilitate **greater two-way engagement** with **users** during the development process. Emphasize long term relationships and partnerships rather than single-transaction interactions to better ensure long-term product success.

- Engage with **employers** in the creation and classroom integration of tech tools. Aligning curriculum with workforce needs better serves both users applying for jobs and employers looking for qualified candidates.

Administrators

The power of the purse and the organizational position of administrators affords them considerable influence over the success of both educators and developers. Administrators can amplify the impact of edtech tools adopted by taking the following steps:

- Provide **professional development** for educators to support necessary adoption and integration of tech tools. Consider starting simply, by aggregating and circulating free resources.

- Seek out **research and data** in adult edtech efficacy to inform the selection and purchasing process. Gather and use feedback from existing sources, such as educator communities of practice.

Employers and Funders

Funders and employers share the same goal: bridging skills gaps and preparing workers for the modern economy. Yet the efforts of these stakeholders have been largely siloed. One key measure can address this:

- **Collaborate** with each other to sponsor adult edtech tool development that addresses skills gaps in the workforce.

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