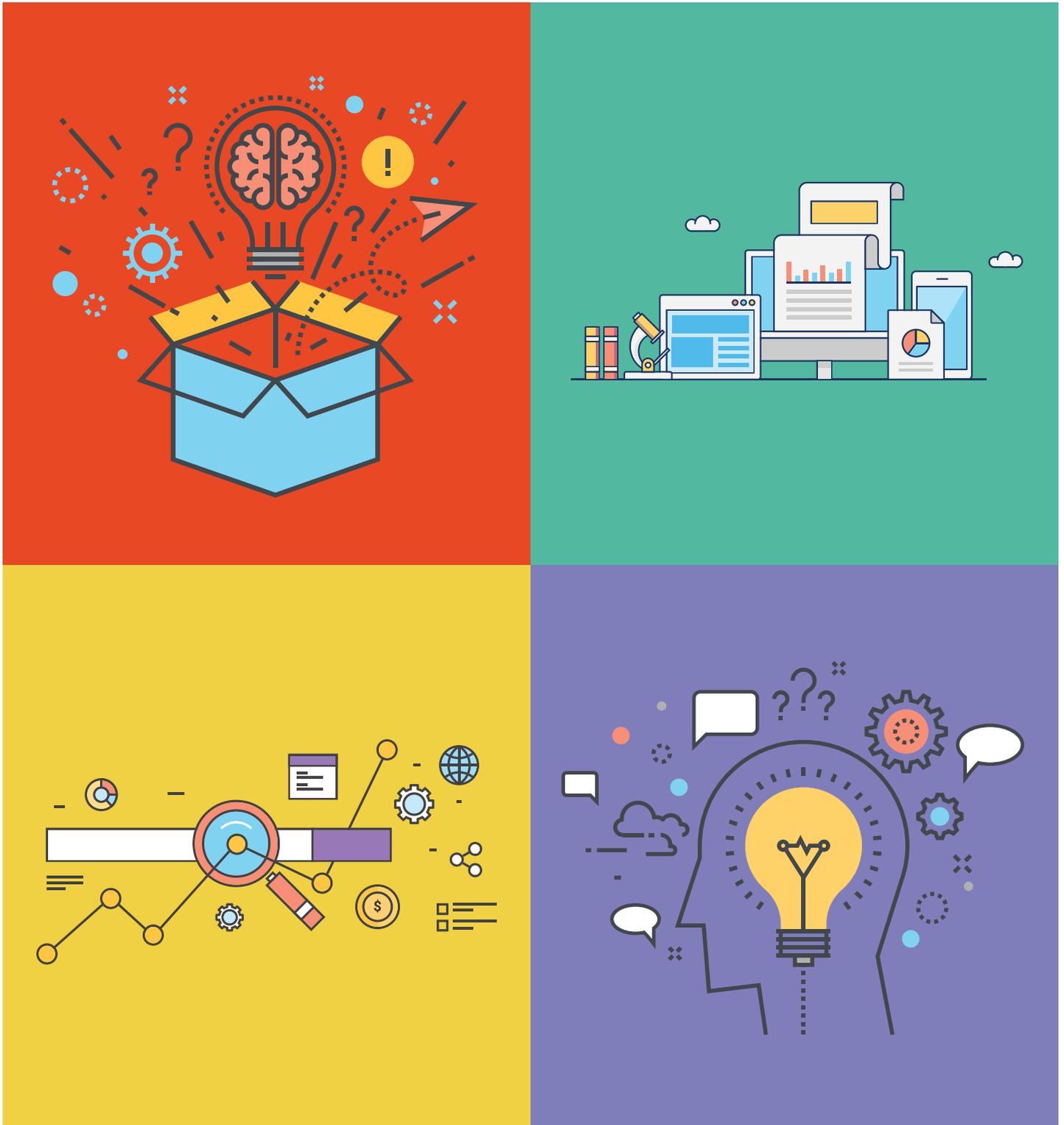


Designing Edtech that Matters for Learning: Research-Based Design Product Certifications

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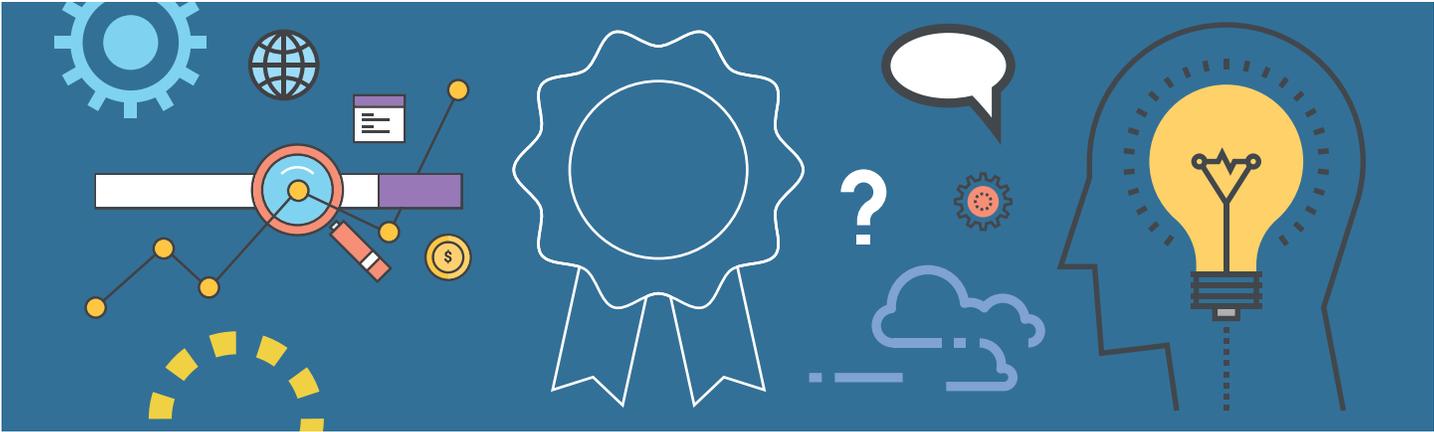


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Product Certification Theory of Change



The Product Certification Theory of Change asserts that embedding learner needs in educational technology (edtech) product quality criteria, and assessing products against those competencies, can lead to greater transparency in the edtech market. Inspired by research from standardized organic food and energy efficiency labeling, as well as educator review of educational resources, this Theory of Change also advances improved product quality and learning outcomes in the intermediate and long term.

Reports from organic food, energy efficiency labeling, and instructional material reviews find that standards and indicators may positively influence consumer awareness and knowledge, consumer decision-making, and industry improvements ([Greene C, 2001 & 2016](#); [Kuchler, et al 2017](#); [Hirsch E, 2019](#); [US EPA, 2017](#); [Vidango N et al 2019](#)). Although there is limited causal research about the impact of standards and indicators on decision-making, there are a few promising examples. For instance, organic certified food labels have positively impacted consumers' desire to purchase organic foods, reduced pollution using conventional fertilizers and chemicals in the food production process, and helped grow the organic food market (Greene C, 2001 & 2016; Kuchler, et al 2017). Additionally, EdReports, a nonprofit organization that assesses the quality of curricula, has become a top place educators and administrators visit to search for instructional materials and access trustworthy reviews ([2018](#)). Reporting nearly 3.5 million total page views of its website, the nonprofit has supported educators in demanding excellence from instructional materials. Additionally, organic certified food labels have positively impacted consumers' desire to purchase organic foods, reduced pollution using conventional fertilizers and chemicals in the food production process, and helped grow the organic food market ([Greene C., et al. 2001](#); [McBride WD, Greene C., 2016](#); [Kuchler, et al., 2017](#)).

Educator Demand

Since 2012, Digital Promise has led research on edtech purchasing and consistently found that choosing the best edtech product is a time-consuming and confusing process. While edtech pilot resources have been developed by [Mathematica](#), [ISTE](#), the [Learning Assembly](#), [Digital Promise](#), and others, [interviews conducted in 2019](#) revealed that the bottleneck occurs before the pilot stage even begins. Selecting the appropriate tool to try is particularly challenging for educators because information about edtech products is largely perceived as untrustworthy, and [some districts have more than 3,500 edtech products](#) to choose from each day.

Over nearly a decade, we have heard from roughly 100 educators and administrators, representing nearly 50 districts and approximately 500,000 students, who say the volume of edtech products in the market makes it difficult to distinguish between tools and assess their value. Information about tools often originates with the products themselves, which leads to questions about the reliability of the claims. Because of the range of quality among edtech products, educators end up relying on referrals from peers to narrow their options; peer recommendations, though, rarely account for unique learning goals and learner contexts. Time and again, educators and school and district administrators have asked for a way to more easily, and reliably, compare edtech products based on criteria that matter to the consumer.

Recently, ISTE and Project Unicorn released the [Five Pillars of Edtech Selection](#). Each pillar represents a consideration when comparing and selecting edtech tools: data interoperability, student privacy, standards alignment, research and evidence, and implementation and ongoing support. In a perfect world, all edtech products sync with existing systems, responsibly steward student data, align with existing priorities, leverage research on learning in their design, and support educators throughout implementation. Until these pillars are universally met, however, educators and administrators need a way to substantiate whether products meet criteria in each of these domains.

Digital Promise has focused on the fourth pillar—research and evidence—because we believe products grounded in learning sciences research also have the potential to support learner variability, which is a priority for many teachers and parents. A [national survey](#) commissioned by Digital Promise in 2019 revealed widespread agreement among teachers, parents, and the general public that schools should focus on helping students reach their full potential as learners. The majority also agree that students vary from one another in how they learn, and that technology is improving students' learning experiences. Edtech offers an opportunity to help meet diverse learner needs, but only if it is designed using research about how individuals learn.

Through focus groups conducted with 40 educators and administrators in fall 2019 (to access Appendix C, the equity criteria used to select participants, please submit a request to productcertifications@digitalpromise.org), we determined that a research-based product certification offers several benefits. The certification would:

- Hold edtech vendors accountable to a clear set of criteria
- Create competition among vendors to use research
- Save time for consumers by narrowing the options when searching for learning products
- Bring credibility to edtech selections
- Help persuade school boards to make a purchase
- Offer a way to compare similar products on the same criteria

With these findings in mind, Digital Promise has designed and implemented a Research-Based Design product certification. The certification will be awarded to edtech product teams that submit evidence verifying the link between research on how people learn and their product's design. The certification uses a competency-based learning framework, developed in consultation with our Learner Variability Project advisory board and expert researchers in the Learning Sciences, and has undergone multiple iterations of testing the application with product developers and consumers alike. As a result, this product certification serves as a rigorous and reliable signal for consumers.

Why does a research-based design product certification matter?

Digital Promise believes research-based products are ones that are most likely to support the full diversity of learners because their design is based on valid, empirical research about how people learn. This link between research and product design can be clearly evidenced in logic models, theories of change, and similar artifacts that document the product design process. There is research that demonstrates the benefits of user research in the design process ([Tripathy, Gluck, & Li, 2018](#)), but there is a significant lack of research examining the impact of learning sciences research to guide the design of edtech products and features.

Digital Promise has learned that while educators want to know whether a product will improve learning, there is a strong distrust of product-authored studies. While some educators share a greater trust of studies conducted by third parties, the education community has also seen examples of companies cherry-picking positive results and burying reports that found no impact or even negative results. Moreover, we have learned that edtech efficacy or pilot studies are largely impacted by myriad variables outside of researchers' control, such as implementation fidelity, educator buy-in, and technological infrastructure—meaning results are almost entirely dependent on context.

Today, educators and administrators report fatigue from piloting products that do not meet student needs, or their budget, and thus only stay in classrooms for a few months to a year before being removed. How can we help educators narrow the edtech search to find products that are most likely to meet their students' unique learning needs?

Through product certifications, we are taking a new approach to communicating about product quality that mitigates some of the challenges of the past. Before considering product efficacy, it is vital to know if a product is truly based in research about how people learn (see Table 1).

Table 1. Types of Research Use in Product Development ([Simone & Gross, 2017](#))

Research in Design	User Research	Evaluation Research
Using existing scientific research on learning to inform product design	Gathering information about how users interact with the product or prototypes of the product to make improvements	Conducting a formal research study to determine whether the product is effective in promoting learning or solving a problem in education

Research-based design has the potential to reimagine edtech to uniquely serve each individual learner. When creating a new or innovative edtech product, it is critical to identify an authentic learning challenge, to review research to deeply understand the factors involved and how they affect the challenge, and to create a design blueprint based on that body of research. This approach is essential to the innovation process, especially as new designs and adjacent technologies start to flow together.

Consider how innovations arose in fields external to edtech. For example, we can look to NASA as a source for many everyday products that came through rigorous research and design processes. These range from traction-enhancing grooved pavement, to infrared reflective blankets, to handheld medical imaging devices ([Lockney, 2017](#)). Similarly, technologies like computer networks, the internet, and miniaturized electronics that make GPS and handheld devices possible all came through the Defense Advanced Research Projects Agency (DARPA) research and design program ([DARPA, 2016](#)). This reinforces the idea that only once rigorous research and design are completed can user research and efficacy studies be done. These innovations that have solved pressing challenges for society, as edtech can do across education systems, would be impossible without a fundamental understanding and application of the research in the design process.

Edtech products, whether heralded as an innovation or not, need to be effective. This is a non-negotiable for students, families, and educators. While there may be a desire to quickly seek efficacy studies that determine the quality of a product, there are fundamental research and design processes in which edtech products must root their effort. This may seem like it would slow the process of creating new, innovative technologies, but it's

worth it: The core of innovation is about solving problems not yet solved. By incorporating research about how individuals learn from the start, we believe these products are most likely to be effective for all learners and truly innovative.

ReadWorks Case Study

Digital Promise's Learner Variability Project (LVP) partnered with ReadWorks to incorporate the development of research-based features that support learners with diverse needs ([Tare & Shell, 2019](#)). ReadWorks is a national nonprofit that provides a free, K-12 literacy edtech platform. This was a unique partnership as research suggests many edtech product teams do not engage with learning sciences research when designing and developing products and features ([Vaala, Ly, & Levine, 2015](#)). Instead, product teams often partner with third-party organizations to conduct evaluation studies afterward ([Tripathy et al., 2018](#)). The partnership approach aimed to ground product development in the research of learning at the earliest point in the design cycle.

The partnership began with experts on the LVP team assessing the ReadWorks platform to identify opportunities to integrate strategies from research on supporting reading comprehension. The team made product feature suggestions based on this research. While research on the recommended features in the context of a digital platform is limited, the strategies they are based on have been studied in empirical and practitioner-based literature and suggest potential benefits for learners ([Tare & Shell, 2019](#)).

The LVP team then conducted research to understand how these new features might affect learning via the ReadWorks platform. This included a national survey of ReadWorks users and a study in one school district. The survey yielded more than 11,000 K-12 educators' responses. Its results indicated that the majority of educators who tried one or more new features observed it supported students' learning ([Tare & Shell, 2019](#)). Moreover, almost 90 percent of educators reported that they are likely to assign more articles on the ReadWorks platform, and over 80 percent of educators said that they are likely to assign higher-level articles on the platform, given these features. This is a clear indication that research-based strategies can affect teacher decisions and behaviors that support rigorous engagement for students.

The district-level study saw nearly 2,000 students complete ReadWorks assignments, of which 92 percent used at least one of these new features in a 1-to-1 student to digital device learning environment. Researchers measured students' rate of attempting multiple choice comprehension questions after reading a ReadWorks article to understand student engagement with the platform. The study found that when students used at least one new feature, their rate of multiple choice question

attempts increased by over 10 percent for articles considered average difficulty, and the rate jumped by over 20 percent for articles considered difficult. The pilot also found that, on average, increased use and performance on the ReadWorks platform was positively related to students' growth on standardized test reading scores over the school year.

A sixth-grade classroom teacher touted the benefits seen from the research-based strategies in the product: "I use these features to differentiate learning for students. My class is a diverse group with a reading range of grade three to eight."

Together, these results suggest that the research-based features raised teacher expectations for student comprehension performance, empowered students to take ownership over their learning, and likely supported increased student learning outcomes. As a third/fourth-grade classroom teacher explained, "I find these features helpful for students when I am working in small groups, and students are working on their own. Students have support when I can't help them." This study represents a first step in examining how research-based features in edtech can support diverse learning needs; the promising results should encourage the field to call for truly research-based products.

Certification Design Process

Digital Promise is committed to developing innovations that solve authentic challenges educators and school and district administrators experience. In order to create a valuable solution for edtech decision-making, our team engaged in a rigorous year-long development process that incorporated nearly 150 stakeholder voices across the field to create the Research-Based Design product certification. Below you will find our design process at a glance; for more information about the design process, contact productcertifications@digitalpromise.org to access Appendix A: Design Process.

December 2018–January 2019: Challenge Scoping

For years we have heard from educators about their challenges with edtech selection and procurement. More recently, we shifted our focus from developing edtech pilot resources to exploring supply-side levers for change. Beginning in late 2018, Digital Promise conducted a [listening tour](#) with more than 50 education stakeholders across the country to understand the most pervasive challenges facing the current edtech industry. We heard testimonials of limited available product information, no outlet to compare products, and a lack of incentive for products to design for diverse learners.

Through these conversations, stakeholders advocated for an indicator to help narrow down the number of products they consider during the [edtech selection stage](#). It was clear that creating dozens of seals of approval would only result in a noisy and unclear market. Instead, we asked education stakeholders to share their priorities when selecting edtech tools and focused on creating product certifications for the priority areas that overlap with Digital Promise's expertise.

February–April 2019: Design & Develop

Based on the findings from the listening tour, Digital Promise drafted the competencies and criteria that would guide development of product certifications. We collaborated with the [Learner Variability Project's advisory board](#), district leaders in the [League of Innovative Schools](#), and product developers to test, refine, and iterate on the drafted language.

After five rounds of iterations based on thorough insights and feedback, we developed these [competencies and criteria](#). We also worked with internal and external partners to design product certifications that would embrace our value of continuous learning by creating multiple entry points and scaffolding growth opportunities for edtech products.

May–July 2019: Implement & Iterate

In late spring, Digital Promise created an alpha application for the first certification. Five products were invited to participate in the alpha testing, and the companies provided invaluable feedback and insights that guided the next round of iterations and improvements.

August–September 2019: Design & Develop

Digital Promise invited select edtech products to participate in beta testing of the product certification application. We received 30 applications along with feedback, suggestions, and insights from product companies around the world. Through the beta testing, our team honed in on the evidence required to earn the competency-based product certification, and we built a robust, multi-assessor review process to ensure product certifications were powerful indicators for the field. (To learn more about the review process, see Appendix B, which can be accessed by sharing your email address and professional role with us.)

October–December 2019: Inquire & Investigate

Committed to designing a solution that meets the needs of the full diversity of learners, Digital Promise created Equity Selection Criteria (contact productcertifications@digitalpromise.org to access Appendix C: Equity Selection Criteria) to identify and recruit diverse representatives to participate in the fall 2019 pilot study. Digital Promise collaborated with 40 education stakeholders, including superintendents, district administrators, principals, educators, and instructional coaches, across 13 school districts representing over 400,000 students to test and improve the indicator. Stakeholders offered insights to ensure the product certification could be seamlessly integrated into edtech decision-making processes. Here is a sampling of what we heard from them:

“We want to support our teachers and students with tools that will allow them to use high-leverage strategies for teaching and learning. We also have the responsibility of keeping their identity and personal data safe. The research required to do this is time-consuming. The edtech industry is massive, and many of the products are not as advertised. I’m thrilled our partners at Digital Promise understand this dynamic and are taking actionable steps to help educational leaders streamline the process of aligning digital tools with the goals and priorities of school districts.” - Howard Bissell, Director of Instructional Technology, Lexington Co School District 1 (Lexington, SC)

“This product certification fills the learning sciences void we don’t see that could give us a stronger argument or support for a product that we really felt would benefit students. I think it also just takes a lot of that work out of the equation because that work was essentially done for us.” - Mark Benigni, Superintendent, Meriden Public Schools (Meriden, CT)

“We need something to make it a little easier to compare products. Just talking to vendors, of course they are going to say that their product is the very best ever designed for learning.” - Vicky Ozment, Deputy Superintendent, Talladega County Schools (Talladega, AL)

“Teachers don’t really have time to explore a ton of new products and figure out if they incorporated best practices, so I would use the list of certified products as a reference point. Having the learning sciences based-design would assure me that I could go to that product’s website and learn about classroom implementation and how to use

it effectively pretty quickly. I feel like a lot of coaches and digital learning specialists would probably use [certifications] the most.” - Danielle Johnson, Digital Learning Coach, Carrollton-Farmers Branch ISD (Carrollton, TX)

Every stakeholder who participated shared that they felt confident in the application questions— particularly how each question requires evidence from the product—and they looked forward to the benefits of this solution:

- The Research-Based Design product certification allows educators to feel confident that the product applies the best strategies to foster learning.
- Product certifications serve as a vetting process often too burdensome, time-consuming, and technical for school and district staff to take on themselves.
- Product certifications flip the edtech industry to be driven by educator need, rather than product availability.
- Product certifications raise the bar for edtech products, hold them accountable for their claims, and help users compare products.
- Product certifications help narrow the search and bring credibility to selections.
- Product certifications can help district leaders and educators advocate for the needs of their students by selecting tools most likely to provide valuable learning.

Research-Based Design Product Certification Scope

While Digital Promise intends for product certifications to provide transparency and clarity to the edtech market, we want to acknowledge the scope of this work to consider the challenges certifications do not solve.

Much of the basis of product certifications stems from Digital Promise's [Marketplace](#) initiative, which aims to support smarter supply and smarter demand in the edtech marketplace. We believe piloting edtech tools is still incredibly valuable and necessary for the field, and product certifications do not replace the importance of piloting products and conducting efficacy studies.

As an organization that works at the intersection of educators, developers, and researchers, when awarding certifications to products, Digital Promise will not be endorsing the product as a whole—rather, only for the certification category that the product has earned. For example, a product that has earned the Research-Based Design certification will have demonstrated that research about learning is at the core of product design and development. However, this certification does not consider efficacy or impact studies, which means it does not imply a product has demonstrated its impact on students or that it will work within a specific classroom, school, or district context. Understanding context and implementation is where piloting and efficacy research still play a major role. Product certifications should support educators in identifying products worth piloting and continue to articulate and test their goals for edtech products.

Certified Products

In fall 2019, Digital Promise invited product teams to participate in our pilot to test, refine, and launch the Research-Based Design Certification. We received 30 applications and designed a rigorous assessment process to ensure products that received the certification met the criteria:

- the use of rigorous research about learning and education to inform and drive design decisions;
- a theoretical framework to demonstrate the ways research is consulted throughout the design process; and
- an easily accessible public-facing artifact that shares the product's research basis, such as a blog or video.

Digital Promise is pleased to announce the 12 products that earned the Research-Based Design product certification (contact productcertifications@digitalpromise.org to see Appendix B: Assessment Process). We appreciate the time and commitment from each applicant and congratulate the products who earned this certification.

Explore the list of certified products [here](#).

Get Involved

We are excited to further engage stakeholders from across the education landscape and to share ways to get involved in this effort.

- **Product developers and entrepreneurs:** Review the certification criteria and apply for the open certification on Research-Based Design. By completing an application, products will have the opportunity to earn an [Open Badge](#) from Digital Promise. All products that apply will receive confidential feedback from expert reviewers on how to continually improve, including products that do not earn the certification. Further, results will only be shared publicly if a product has been awarded the certification.
- **Educators:** There are a number of ways to shift the current market to favor certified products. Signaling to edtech companies that you prioritize certified products that have earned Research-Based Design certification is a strong first step. You may also be in a position to create or shift school and district-wide procurement policy that aligns with the commitment to prioritize certified products. Additionally, consider joining the certification creation and review process with Digital Promise—email our team to share your expertise and have your voice heard at productcertifications@digitalpromise.org.
- **All stakeholders:** Sign the [Research Based Product Promise](#) to join us in demanding high-quality edtech products for all learners.