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Edtech Usability Guide:

Shaping Your Product Roadmap

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Introduction

In an ideal world — with unlimited time, money, and other resources — all edtech products would undergo rigorous testing and be loaded with the perfect mix of features to help end users. But in the real world of edtech product development, trade-offs are necessary, and getting a well built product to market in a reasonable timeframe can be challenging. How should product developers prioritize certain features over others? What gets priority on the roadmap?

ISTE's Teacher Ready initiative offers edtech providers, end users, and edtech buyers a research-based, practitioner-tested, and straightforward way to understand, evaluate, and design high quality products. By focusing on teacher usability – including the technical, pedagogical, and social components that make a product great – Teacher Ready clearly lays out baseline usability requirements for edtech products today.

This guide aims to help edtech product teams grow their understanding about what makes products usable for teachers, apply that understanding to product design, and more effectively avoid common pitfalls in the development process. In particular, this guide may be helpful for:

- Teams early in the product development process
- Teams interested in validating product usability ahead of new product or feature launch
- Teams that are looking to level up the usability of their current products

USABILITY AND PRODUCT DESIGN

Let's unpack Teacher Ready to explore some key usability concepts across the product development lifecycle! This guide briefly describes high-level stages in the product design process and, for each stage, identifies relevant components of the Teacher Ready framework to consider.

While the sections that follow are self contained, you may also find it useful to reference the Teacher Ready evaluation tool and documentation.

Because it's designed to be actionable, this guide's tips are organized around general steps in the product development lifecycle. During each step, the guide unpacks:

- **What to know** – A quick exploration into how usability shows up during the step.
- **How to do this well** – Tips to keep in mind when it comes to this step. Those lists could be really long, but this guide aims to deliver only a few that are essential.
- **Teacher Ready and design** – Ways that the Teacher Ready framework applies to each step. The guide highlights some dimensions and relevant indicators. Again, these lists could be long, and the guide only points to a handful of important intersections. Note that this guide references indicator numbers to help you align this guide with the Teacher Ready framework.
- **Insights from product providers** – To shape this guide, ISTE talked with several members from product teams. This section offers you some direct, anonymous insight into what they said.
- **Pitfalls to avoid in product development** – An explicit discussion of what not to do in product development.
- **Pro tips** – Some quick tips that didn't make it into an earlier section, but felt really important to mention.

Additionally, there is a glossary at the end of this guide that lists key definitions of Teacher Ready indicators and also terms and concepts you may not yet be familiar with.

While the primary goal of this guide is to help product teams build better products, the tips in this guide may also speak to edtech decision makers by shedding light on the development process, including how and where to look for teacher usability in product design.

Discovery

Before you design anything, you have to research the real world context of the people you want to help. Discovery is marked by understanding your end users – such as K12 teachers, staff, or school leaders – including what they need and how they work.

WHAT TO KNOW

- Usability is all about making people's lives better by building tools that make processes more efficient, effective, and inclusive.
- A great way to start your discovery is by immersing yourself in the lived world of someone else. This is the heart of empathy – understanding your users and what they experience. Digging into very specific problems they have can point to specific features you might consider later in your product design!

TEACHER READY AND DISCOVERY

- Dimension 1, **User Interface and Agency** – What does the daily workflow look like? How do users want to manage information? Do not try to mold their behavior to your mental model for the product; instead, mold the product design around their workflows and mental models.
  - **Value Proposition** – If you can't explain how your product will make an end user's life better in one sentence that resonates with teachers, start over. (1.1)
  - **Interface Design** – More is not always better, and that includes product features! Make the features and buttons that will be important to users easy to find. Make sure your product's user interface is quickly pointing a new user to the most important functionality right from the start. (1.4)
  - **Discoverability** – Teachers don't have a lot of time on their hands to explore new products or features. If you make it easy for a teacher to find their way through your product, such as with search and filter functionality, you're making their lives easier. (1.5)
  - **Interoperability** – If your product works well with other common applications (especially key data sources like LMS and SIS products), educators and administrators will be grateful and will find your product more useful. Start with interoperability standards (e.g. Ed-Fi or 1EdTech) and mechanisms in mind instead of as an afterthought. (1.9)
- Dimension 4, **Inclusivity** – It's easy to over-rely on a user experience based on your own lived experience. Don't take the easy way! Step into your target users' lives. What resonates with your target educators and the students they serve? This is about representation and also opportunities for deepening understanding through windows and mirrors* in the design of your product.
  - **Diverse Representation** – Do the work to understand the variety of experiences and cultural backgrounds of the teachers you want to reach and their students. Products that reflect those backgrounds without relying on traditional stereotypes is the highest goal here. (4.1)
  - **Empathy Opportunity** – The world is political, and a plethora of viewpoints can provoke conflict or deeper understanding. A deep understanding of the world of your target users can help you design a product that offers students the chance to take the perspective of others, encouraging them to learn about others and themselves. Consider how your product can build this kind of understanding from the outset, and not as an add-on later. (4.2)

HOW TO DO THIS WELL

- First, identify your target audience and users. Be specific! You can't be "everything" to all educators. What kind of teacher or leader are you trying to help?
- Then, actually watch your target users in their world and have them tell you what's important to them. Consider UX research methods like **think alouds*** or classroom observations to really immerse yourself in the world of your users.

INSIGHTS FROM PRODUCT PROVIDERS

- **You have to understand what someone actually means, not what they're saying.**

  "We start with design requirements, getting feedback from the field and teachers. We show people the prototype and get more feedback. You have to understand not what someone is saying, but what it is they actually mean. How do you get smart about solving that problem in a way they didn't think about solving? People tend to solutionize…[We developers] have to listen critically and get a good understanding of what is the real pain point or problem."

- **Understand your customers and their needs.**

  "We start with wanting to understand the customer problem or the end user problem. So what is it? What are the challenges that educators are facing in their classrooms today? And then how can we best go about supporting and addressing those challenges? Oftentimes we'll do things like classroom visits to understand what we are seeing as those challenges, and also facilitate focus groups and interviews to really drill down into those challenges."

PRO TIPS

- **Know your product principles.** Your product can't be everything for everyone, and while there exists a lot of research – including the learning sciences and user experience design principles – that should guide your product development process, you also need to commit to a set of product principles that you stick to. For instance, if student exploration is something you value, then you'll need to curtail the use of explicit instructions in the student experience. One isn't better than the other: they're trade-offs. Knowing the values or principles that matter most will help you make sense of all the feedback that you'll collect later when testing prototypes.

- **Know your audience and keep them in mind.** Always be discovering and designing for your target audience. As more information comes in, don't lose sight of who you're designing for, and stay focused on their problems or challenges.

PITFALLS TO AVOID IN PRODUCT DEVELOPMENT

- **Taking a single idea that a small team came up with and running with it.** Really get out into the world and see what problems your target users are facing. Grounding product design in lived experience – rather than your idea of how things should work – will likely lead to a more usable product. Don't assume you know what users need from the outset.

- **Being too attached to early ideas.** While it's important to have and stick to product principles and company values, listening to your users is essential if you want a product that people love and is usable and effective in the field. If some of your early ideas aren't matching up with what you see in real classrooms or schools, move on to a new idea.

Design

Once you have a strong understanding of your target users and their lived experience, it's time to identify key features and mechanics of your product. How will it work? What problems will it NOT address or solve?

WHAT TO KNOW

- All products have basic "technical" usability components such as features that work correctly and are easy to use. In education, there is an added layer of "pedagogical" usability that is unique to the work of teaching and learning: the product should be easy to use AND support, guide, and enable effective teaching and learning.
- There are competing interests when it comes to edtech product design. What kinds of features do you prioritize given limited resources, including time and money? Will some features help solve for the most critical challenges your users identified during the discovery phase? Having teachers or former teachers on your product team can also help you catch many of the pedagogical features that are essential to products that aim to serve teachers and students.

HOW TO DO THIS WELL

- If you want your product to be designed in a way that effectively helps students learn, you're going to have to align feature development with principles of good instructional design. **Clark & Mayer's principles of good multimedia design*** are relevant here, as are Universal Design for Learning (UDL) principles. If you design with these in mind, you're likely to help more learners.
- Don't cut corners. Good product design relies on deep expertise in UX and learning design. Skimping on these areas may produce short-term cost savings but create significant challenges in the long term as it relates to impact and customer retention.

TEACHER READY AND DESIGN

- Dimension 2, **Learning Design** – You're building a product to facilitate learning, so make it about the learning. There is a rich body of insight from the learning sciences – align your product's features to the science behind how people learn best.
  - **Content Type** – A variety of learning information (visual, text, verbal, etc.) generally enriches the learning experience, but you have to make sure to use various modes that create traction – and not distraction – in the learning process. Keep it simple while also leveraging multiple media types. (2.4)
  - **Recall & Reinforcement** – It's common to think of learning as the process of getting information into someone's brain, but pulling the information out is also critical for learning. A good product design regularly requires students to retrieve and reflect upon what they already think or know; regular quizzes are great for accomplishing this. (2.6)
  - **Elaborative Reflection** – Thinking about our learning process and making connections between new and old information are key aspects of successful learning experiences. Make sure that learning experiences are explicitly encouraging students to reflect and make those connections. (2.9)
- Dimension 4, **Inclusivity** – Design your product in a way that's accessible to all learners.
  - **Accessibility** – Digital multimedia content should include basic accessibility requirements including closed captioning for videos, speed control, and high contrast design. Don't be convinced that light blue words on a white background are a good idea; they might align to your company brand, but it's too hard to see! Universal Design for Learning (UDL) principles* are a great reference to consult if you want better accessibility. (4.3)

INSIGHTS FROM PRODUCT PROVIDERS

- **Carving out a space for innovation – where the product team engages with real end users – can quickly yield big insights.**

  "Through our innovation incubator program, we work with educators and administrators from a diverse set of districts and schools across the country, representing all grades K-12 and the majority representing schools that are Title I. Our product development team works hand in hand with those folks in the innovation incubator who are giving real-time feedback on the features as they're being developed – so they might be looking at actual wireframes, sharing usability feedback, and talking to us about how easy and intuitive (or not) a feature is."

PITFALLS TO AVOID IN PRODUCT DEVELOPMENT

- **Audio that accompanies videos should complement** – and not narrate – what's on the screen. When a narrator reads the words that are present on the screen, it forces the parts of the brain in charge of hearing and seeing (respectively) to compete with each other in a way that reduces understanding. It's not unlike if you had to identify the color of the words **green**, **red**, and **blue** – it's hard on the brain!
- **Too much cognitive load.** Simplicity can be brilliant, and too much information can overload or distract teachers from how the product can work best. Think carefully about paring down what teachers see so that your product design inspires effective pedagogical practice.

PRO TIPS

- **Involve teachers in the design process.** Having a teacher (or three) engaged in your design process will help ensure that the product speaks to that audience. ***Listen closely when you are in discussions about prioritizing feature development.*** And in those design sessions, listen not only to what someone is saying, but listen for what they actually mean and the acute challenges they need help addressing.
- **Overcommunicate.** It's easy for key pieces of information to get lost in the work process. Especially in unfamiliar terrain, it's important to overcommunicate customer needs to developers and product designers to ensure everyone is aligned to a cohesive product vision and goal. Drift happens, and communication can help keep your team on course.

Prototyping & Iteration

You understand your users, what they want to accomplish, and their pain points. You've translated those learnings into a product design plan and feature ideas. It's time to build your prototypes and test them!

TEACHER READY AND PROTOTYPING

- Dimension 3, **Digital Pedagogy** = Edtech has the power to redefine the student learning experience. Simply substituting an old method (e.g. overhead projector) with a digital analog (slides) may create marginal improvements, but may not tap into the potential to dramatically change teaching and learning. How can you best take advantage of edtech's capabilities to foster learning experiences that are beyond what we could do in the past?
  - **Authentic Learning** – It's the nature of edtech development that adults are making products that feature content that is supposed to resonate with younger students. Rather than guessing, get student feedback on what kinds of authentic* situations resonate! Students will usually be pretty candid, and hearing what they have to say can be fun. (3.1)
  - **Collaborative Interaction** – The nature of work is social, and some learning experiences should be too...but some group activities can fall pretty flat. An easy prototyping exercise is to generate multiple methods for collaborative learning activities (e.g. multiple ways something could happen); pitch the ideas to teachers or students, and see which ones stick and how they can be even better. (3.5)
- Dimension 5, **Assessment and Data** = Students want to know how they're doing, as do their teachers. Ask educators about the data they need and how it makes sense to act on and organize those data. While you're at it, you might experiment with some ways to get students feedback about their performance too.
  - **Feedback** – Students need to know how they're doing, and good student feedback is specific, constructive, and actionable. What do students want to know about their performance, and when do they need to know it? What feedback mechanisms are motivating for students? Which are demotivating? (5.5)
  - **Performance Results** – What kinds of results do teachers actually need when engaging with your product? Think aloud protocols can really help you dial in what your teachers are going to need when it comes to student results. (5.6)

HOW TO DO THIS WELL

Prototyping – which includes getting and using feedback to iteratively improve product designs – is a skill that can be developed. If you want to be good at prototyping, you will want to keep the following in mind:

- Negative feedback and prototype failures are great insights! Failing fast and early is good; failing slowly later in the process is painful.
- Don't just try out your top one or two ideas. Instead, test and try out a lot of ideas with your target market, especially early on when it costs very little. Bring lots of early stage prototypes to potential users for feedback.
- Don't assume you will know what people will say before asking them. Work with real target users, create space for them to provide candid responses, work with them often, and get them to talk and react. The less you talk, the better, because it means they're talking more, which means more information for you. Great user feedback sessions should involve very little in the way of instructions.

- Keep your prototypes minimalist. Be "lo-fi", especially at the start. If you put color in prototype drawings, people will comment on the color. Make sure that your prototypes reflect what features matter most in the product design so that you draw people's attention to those features, and not something else.
- Thinking in terms of **affordances and constraints*** can be really helpful as you produce prototypes. What does this version of the product do for users? If you took something away, would that result in a better user experience? Remember that constraints aren't necessarily bad – many constraints help us make sense of what we're supposed to actually do in a situation (for example, a small menu with a few good options is easier for diners to choose from than a menu with dozens of choices, which can feel overwhelming).

WHAT TO KNOW

- If you want to make a product that customers will love, get regular feedback that iteratively informs the prototype design. This definitely includes very early stage, lo-fi, "no code" prototypes, including paper-to-pencil sketches as well as designs in digital design tools.
- There is no substitute for real feedback from real people. Ask, "How many teachers have seen this?" Candid, critical, constructive feedback is extremely useful in refining your product.
- Collecting feedback on prototypes can occur throughout the product development lifecycle, from wireframes all the way through close-to-market product versions. Frequent testing with a lot of stakeholders from your target market costs time and money, but the feedback will help ensure that your product is something your customers want.

PITFALLS TO AVOID IN PRODUCT DEVELOPMENT

- **Getting distracted from your core values.** You're going to get all kinds of feedback because different people want different things. Keep your core product principles and values handy, because they will help you figure out how to use the feedback you get. Viewing feedback through the lens of your product principles will help you stay on track to building the best possible version of your product.

INSIGHTS FROM PRODUCT PROVIDERS

- **Usability, marketability, and buildability.**

  "There are three things you want feedback on from both internal teammates and external users: usability, marketability, and buildability. Usability is how easy your product is to use; the less instructions something requires, the better. Marketability refers to whether there is demand for it; if not, don't move it forward because it's unlikely you'll change people's minds. And lastly, if your dev team can't build what you want, find another solution."

- **Gradual release.**

  "Consider releasing your product to audiences gradually rather than all at once to a broader market. This will give you time to address changes that need to be made in your design. Being highly iterative during the prototyping phase will pay off when it comes time to release your product."

- **Regular user feedback.**

  "Doing user testing and collecting feedback is one of the most impactful things we can do to build tools that are helpful for users. If a product team needs to interview an end user about a feature, our team will connect with them quickly. We also have an innovation incubator that sends out a survey once a week: product teams can request to have questions included about specific things like a wireframe, or a super specific question regarding some feature. We also compensate our educators for their time as we know their time is valuable and we include diverse educators in the participant pool."

PRO TIPS

- Often in product development, there's pressure to find the "right" idea and see it through. Instead, try encouraging creativity with brainstorming sessions. For example, start a meeting by asking the team to come up with a list of five terrible product ideas. This can be a fun and productive way to get everyone's brain warmed up for creativity.
- Focus feedback sessions on the design features you're interested in, and show users prototypes that highlight those features. You will get feedback at the level you ask for it (whether consciously or not).

Market Deployment

Product launch day is a big milestone! It's even bigger when you get your first customers. However, the road to a great product isn't ever over. It is important to continuously iterate on customer discovery, product design, and prototyping phases.

TEACHER READY AND MARKET DEPLOYMENT

The Teacher Ready framework offers product providers a systematic way to approach feature development, and is the foundation of the ISTE Seal product certification, a highly regarded industry standard for edtech quality. The framework points to areas you might consider for inclusion on your product feature roadmap. In working with dozens of companies, ISTE has seen how Teacher Ready and the Seal can inform product design; below are a few features companies have highlighted for ongoing development:

- **Student View** – After configuring a learning episode or activity, teachers often want to see what it will look like for their students. Having a "Switch to student view" button may be something that wasn't on the roadmap earlier, but is an expected feature for mature products. (1.6)
- **Support** – It's essential that your users have support resources to help them troubleshoot their experience with your product. Keep in mind that customer support can also help product teams figure out how to prioritize features for your roadmap. (1.8)
- **Content Customization** – Teacher customization of your product may not be on the list of "must haves" in early product development stages, but as the use of your product picks up, it will likely get requested by users. (2.7)
- **Solution Design** – Teachers probably don't want another "drill & practice" piece of software. Exploring how your product can inspire higher order thinking around concepts like problem definition and solution design could set your product apart in an oversaturated market. (3.4)

WHAT TO KNOW

- Letting potential customers know about the research that went into your product can inspire confidence. Remember the learning sciences research that informed your design? It might be good to showcase how your product aligns with that research.
- Product improvement never ends. You'll need to think through how to keep gathering information from users after product launch, and determine how you'll use that feedback for product iterations. You might call this "Continuous Discovery."
- At the end of the day, school leaders and teachers want to know if your product helped teachers do their jobs and helped students learn. The research world distinguishes between efficacy and effectiveness studies. Efficacy studies examine how well your product or intervention works in controlled situations. Effectiveness refers to how well things work in the real world. You are bound to learn more about your product via real world deployments, and figuring out what to do with that new information will be key to your product's long term success.

INSIGHTS FROM PRODUCT PROVIDERS

- **Your product should be designed for learning first and foremost.**

  "A lot of programs are very teacher focused. They're making their job easier but not making learning better for the student. If your product is designed for students and teachers, it must improve learning!"

- **Your product should be simple for a new user to implement in their classroom.**

  "We have shifted our entire roadmap to figure out how to reduce the amount of time it takes for a new teacher to launch a [new] practice set. That's got to be the number one goal: we observed that challenge in real classrooms, and so now, everything else that we're working on is secondary."

HOW TO DO THIS WELL

- **You did a lot of work to get this far. You…**
  - Empathized with your target audience to discover their needs.
  - Reviewed research from education, UX, and learning sciences fields to inform product design.
  - Supported collaborative processes involving learning design, engineering, and even sales to think about product development strategy.
  - Did a lot of user prototype testing to iterate features of your product.

- **Now, you'll need some strategies to help you understand more about your product's effectiveness and its future. You'll need some ways to:**
  - **Collect ongoing feedback** – Generally, the more ways you have to collect user data and feedback, the better. You'll want to be systematic (and not random) about feedback processes and how you prioritize feedback. Think carefully about who can tell you what and when:
    - A quick "tell us what you think" feedback mechanism built into your product is a great option to provide a sense of any trending ideas;
    - Interviews with users who know your product can help you target features to build out further;
    - Focus groups with users not familiar with your product can help you figure out how to onramp new users.

  - **Complete research on product effectiveness** – In today's edtech market, buyers want to know that educators are using the products they license, and that those products are having positive impacts on teaching and learning. How can you get data to explore topics related to product effectiveness, such as teacher efficiency or student learning outcomes? Different users may offer different kinds of research opportunities.

PITFALLS TO AVOID IN PRODUCT DEVELOPMENT

Drifting away from sound design.

When you're in the design to prototyping crunch, it can be easy to stay focused on your product principles and good design practices. But now with a product on the market, sales is a key priority. As you collect feedback from customers, your product will evolve, but don't ever lose track of the research-based principles grounded in the learning sciences and usability, as these should always be foundational in shaping the user experience.

PRO TIPS

- When thinking through how to explore product effectiveness, what are different data sources that you can use to measure student learning outcomes? Think creatively, but also remember to follow data collection agreements and privacy policies.
- Edtech buyers may want to see more evidence about how well your product works. Explore outcomes-based contracting, a model that ensures educational investments are tied to student learning outcomes. An outcomes-based contract means that a substantial part of a payment to a provider is contingent on meeting agreed upon usage requirements (the district) and student outcomes (the provider).
- Product analytics can help you understand who's using your product and how. That can shed light on progress towards your business goals, KPIs, and milestones.

Glossary

- **Affordances** = The features or capabilities of a user interface that indicate how to interact with it. A button says “click me” and a door handle says “open me”.

- **Assessment and Data** = The product uses formative assessments – learning experiences that help make visible what students know and don’t yet know – to generate data that inform teachers about student knowledge and skill gaps, and provide students assessment feedback that is specific, actionable, and constructive. Assessment data informs instructional decisions and the student learning experience.

- **Authentic learning** = Learning activities that cite real world scenarios and issues.

- **The Clark & Mayer multimedia design principles** describe best practices for the design of multimedia learning products, such as how text, pictures, narration, and other forms of information should appear together.

- **Constraints** = Design elements that limit a user’s actions or choices. These can help guide users towards intended actions and functionalities. A button that is grayed out means the action is locked or unavailable.

- **Digital pedagogy** = The product is designed to support the development of digital age learning skills, capacities, and knowledge. This dimension focuses on how technology can help students and teachers experience the best possible learning experiences, including the social and learning affordances that digital educational products uniquely offer.

- **Inclusivity** = The product helps teachers provide learning experiences that are accessible and relevant to students of many cultures, backgrounds, and abilities, and supports learner motivation and agency in the learning process.

- **Learning Design** = The product has features that exhibit and promote design and customization of learning episodes in ways that align with research-based best practices, including those rooted in the learning sciences.

- **Think alouds** = A think aloud protocol is a method used in UX research and discovery where participants verbalize their thoughts, without filter, while using a product or system.

- **Universal Design for Learning (UDL)** is a framework that describes learning product design features that are good for learners from a wide variety of backgrounds.

- **User Interface and Agency** = The design of the product interface and user experience helps teachers quickly and reliably achieve instructional goals. This is about how the product looks and functions, and what it enables teachers to do.

- **Windows and mirrors** = An educational tool for helping students either see themselves (mirror) in a piece of content like a story, or get a glimpse into the life of someone else (window). Great for broadening perspectives and building self-reflection.

ISTE R&D would like to thank MIND Research and GoGuardian for advising on the production of this guide. Their advising helped ground the tips for usability presented here in the product development cycle that many Edtech companies follow.

ISTE R&D's mission is to ensure every educator has access to high-quality, research-backed Edtech that supports, enables, or guides transformational learning. We achieve this by conducting sector-advancing research, evaluating Edtech product design, supporting vendors and practitioners in evidence-based practices, and simplifying the Edtech evaluation and procurement processes for education leaders. Through these efforts, we create a more robust, evidence-driven edtech ecosystem to better serve all learners.