

The
EnterEdTech
Project

<https://www.enteredtech.eu/>



Module 2

Product Market Fit & Evidence-based practices

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Modules



1. The Education Market

2. Product Market Fit & Evaluation

3. Marketing and sales

4. Financial Planning & Revenue Models in EdTech

5. Commercialisation, Marketing, and Pitching

2 Product Market Fit & Evidence-based practices

Objectives

Participants of this module should:

- ✓ understand purchase decision mechanisms and why people buy
- ✓ understand where the buyers get the most influence on the buying decision
- ✓ understand that buyer's respond psychologically to visual elements and storytelling
- ✓ understand that value is relative; every buyer has his own scale
- ✓ understand that buyers tend to buy what others are buying i.e., the crowd effect



2 Product Market Fit & Evidence-based practices

Competences

In the end of this module, you will be able to

- ✓ explain the root cause of startup failure, identify your ideal customer profile, conduct customer discovery research
- ✓ explain the different ways to measure product market fit
- ✓ define/ describe what a proto-persona is, the process for creating an effective proto-persona and to distinguish the effective ways to use proto-personas in the design process



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Units of Module 2

- 2.1 Product Market Fit
- 2.2 Using Proto-Personas
- 2.3 EVIDENCE-BASED PRACTICES of Ed Tech products

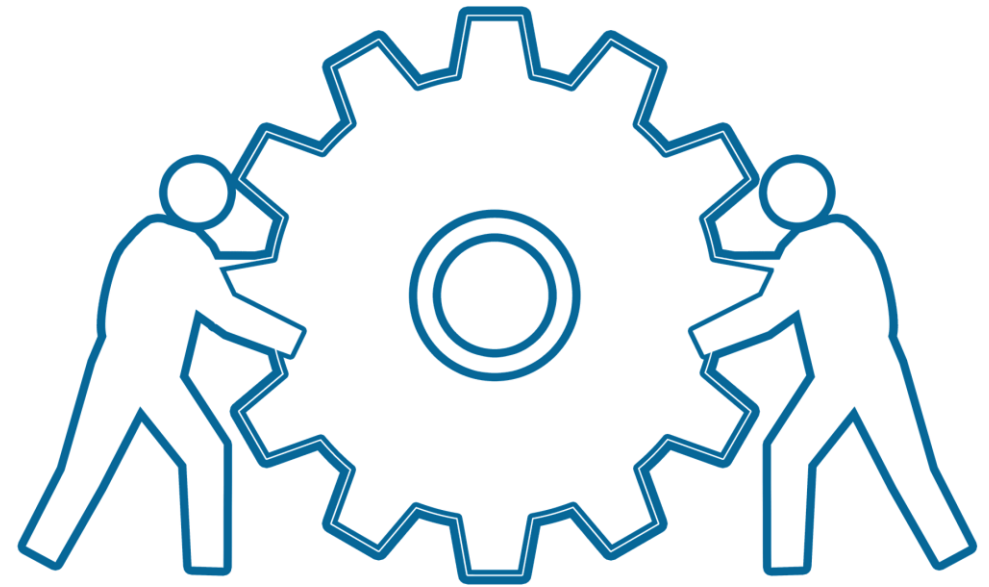
Unit 2.1

Product Market Fit

Objectives

After completing this module, you will

- Define product market fit
- Identify your ideal customer segment
- Conduct customer discovery research
- Measure and observe product market fit

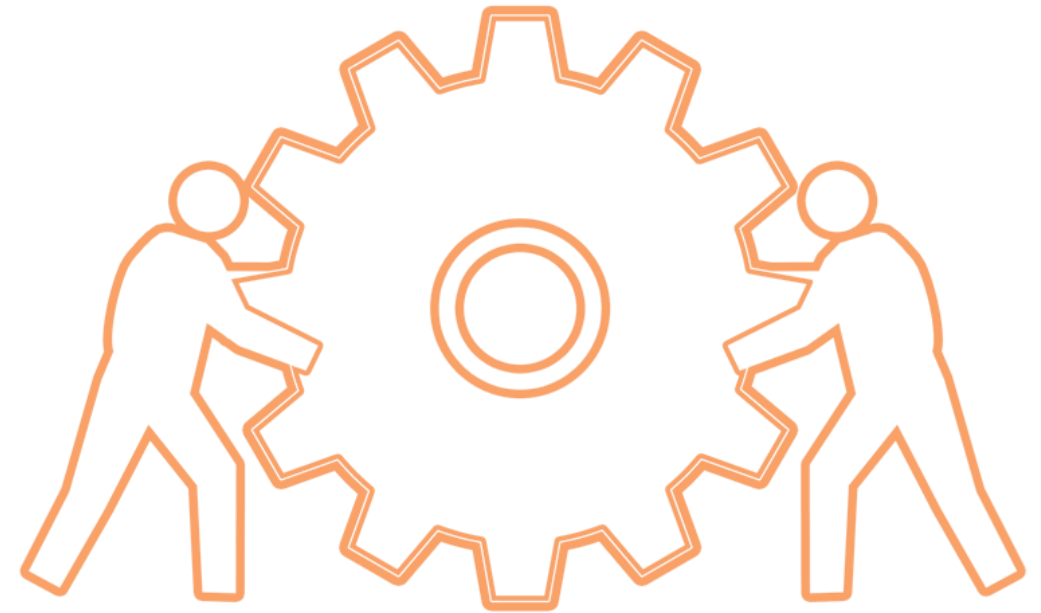


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Competences

In the end of this unit, you will

- ✓ explain the root cause of startup failure
- ✓ identify your ideal customer profile
- ✓ conduct customer discovery research
- ✓ explain the different ways to measure product market fit



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Topics of Unit 2.1 – Product Market fit

- 2.1.1 Keys to Product Market Fit
- 2.1.2 Customer Segmentation
- 2.1.3 Product Market Fit Framework
- 2.1.4 Measuring Product Market Fit

2.1.1

2.1.2

2.1.3

2.1.4

Topic 2.1.1 Keys to Product Market Fit

- **2.1.1 Keys to Product Market Fit**
- 2.1.2 Customer Segmentation
- 2.1.3 Product Market Fit Framework
- 2.1.4 Measuring Product Market Fit



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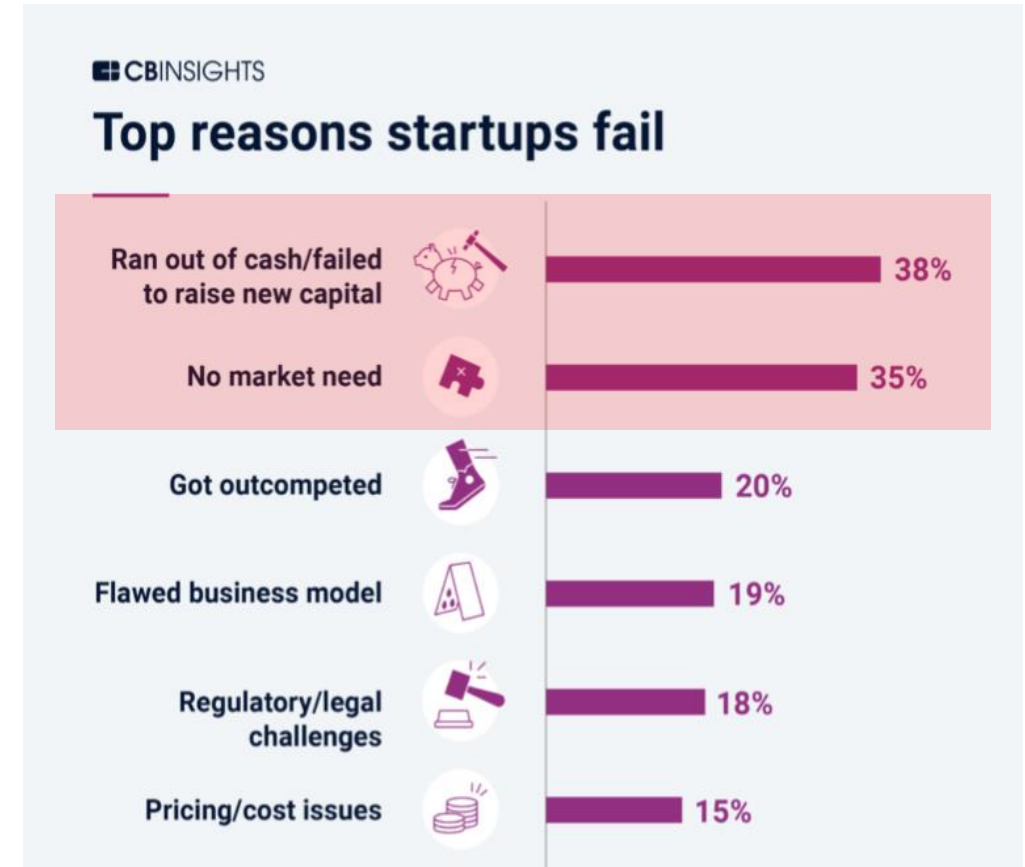
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Root Cause of Start-up Failure

- The top reasons why new products fail are the lack of an **urgent market need** and running out of money in pursuit of a viable business
- Companies reach premature failure by:
 - Attempting to address multiple customer segments early on
 - Spending money on sales and marketing before reaching product-market fit



An urgent market need consists of three components

Urgent

Customers are ***aware*** of the problem and ***motivated*** to take action

Market

Customers are ***similar*** and serve as high-value ***references*** to each other

Need

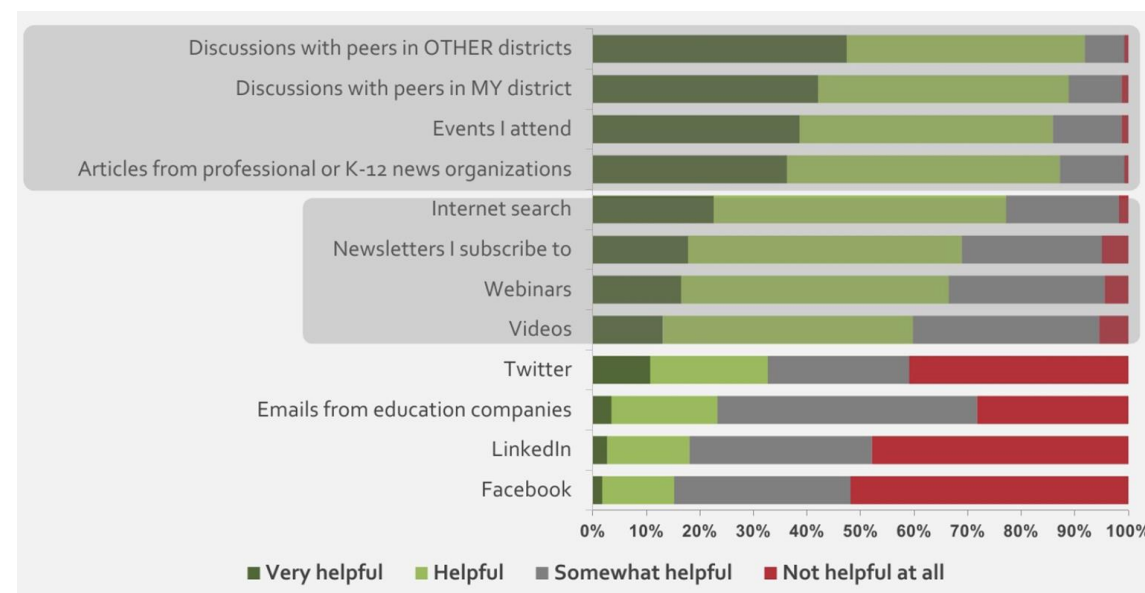
Customers have a ***specific*** problem or goal that has ***consequences*** if unaddressed



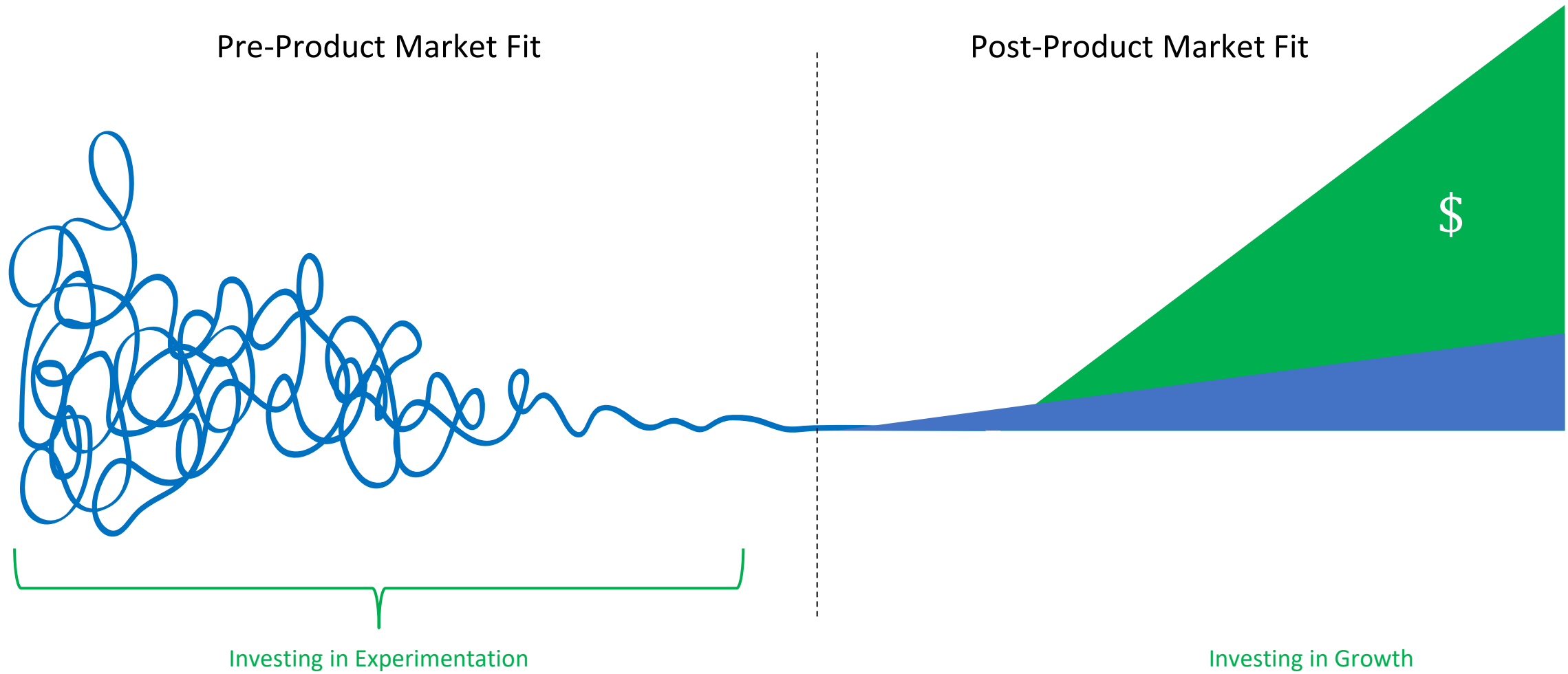
Customers influence each other within segments of the market

- Decision makers value references from other institutions
- Decision makers collaborate in closed groups that may be formed by:
 - Similar size / school type
 - Same geography
 - Same needs
- Example: Association for Supervision and Curriculum Development

Top Sources of Information for Evaluating Edtech Software



Early entrepreneurship is an experiment. Investors want to amplify proven models.



Lesson: Challenge your initial assumptions with customer research

Case Study: 3D Coding Program

- Product: CAD (computer animated design) for young students with integration to 3D printers
- Question: How to best position product to accelerate sales in US K-12 market?
- Approach: Conduct research into three stakeholder groups and applications of the program

Stakeholder	Application	Initial Assumptions (before research)	Market Reality (after research)
STEM Director	Program to teach and practice coding	<ul style="list-style-type: none"> - After school programs - STEM integration 	<ul style="list-style-type: none"> - Too early - Low funding
Librarian	Lessons for 3D Printers	<ul style="list-style-type: none"> - Unused 3D printers - Activities for rotating students - Available budget 	<ul style="list-style-type: none"> - Not important enough
Curriculum Director	Supplemental math	<ul style="list-style-type: none"> - Not best fit for need - Crowded space 	<ul style="list-style-type: none"> - Lots of funding - Kill 2 kids with 1 stone



Edtech companies must overcome unique challenges

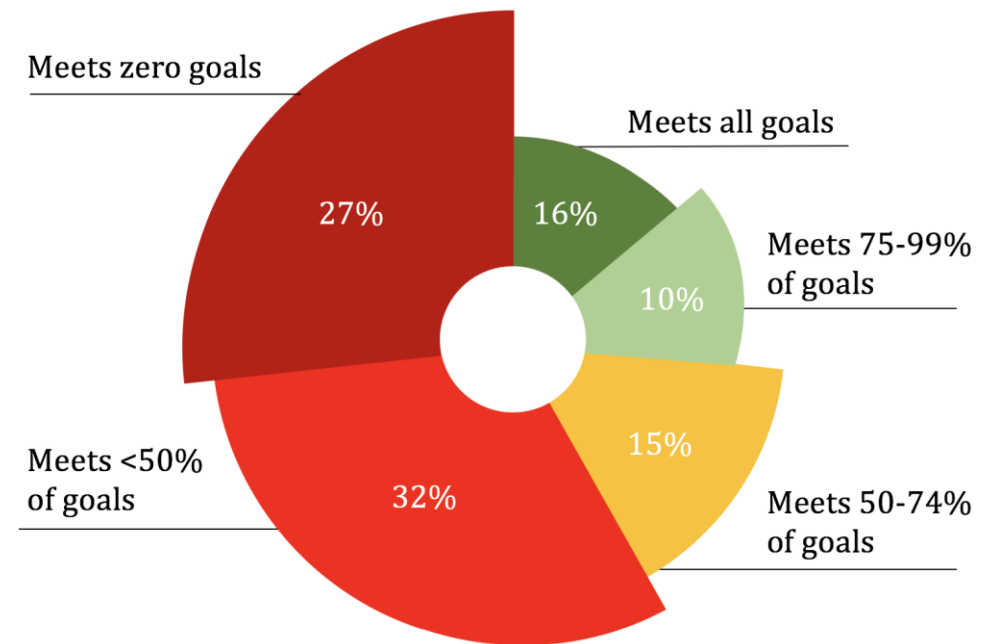
- Long, seasonal sales cycle
 - Selling to institutions often results in a 9+ month sales timeline.
- Institutional resistance
 - Politics and teacher unions limit the capacity of institutions to change
- Crowded, noisy marketplace
 - Thousands of products are being marketed toward decision makers
 - Decision makers struggle to distinguish among solutions and resist unproven products
- Different Users and Buyers
 - The person purchasing an edtech product is most often not the person using it
 - Multiple levels of users:
 - Administration > Teacher > Learner



What to decision makers want?

- Existing edtech software is underutilized due to poor training, staff turnover, and competing interests
- Buyers want references from their peers
- Points of credibility
 - Authentic testimonials
 - Case studies
 - Efficacy research
 - Different levels of efficacy

Utilization of EdTech Products Based on Implementation Goals

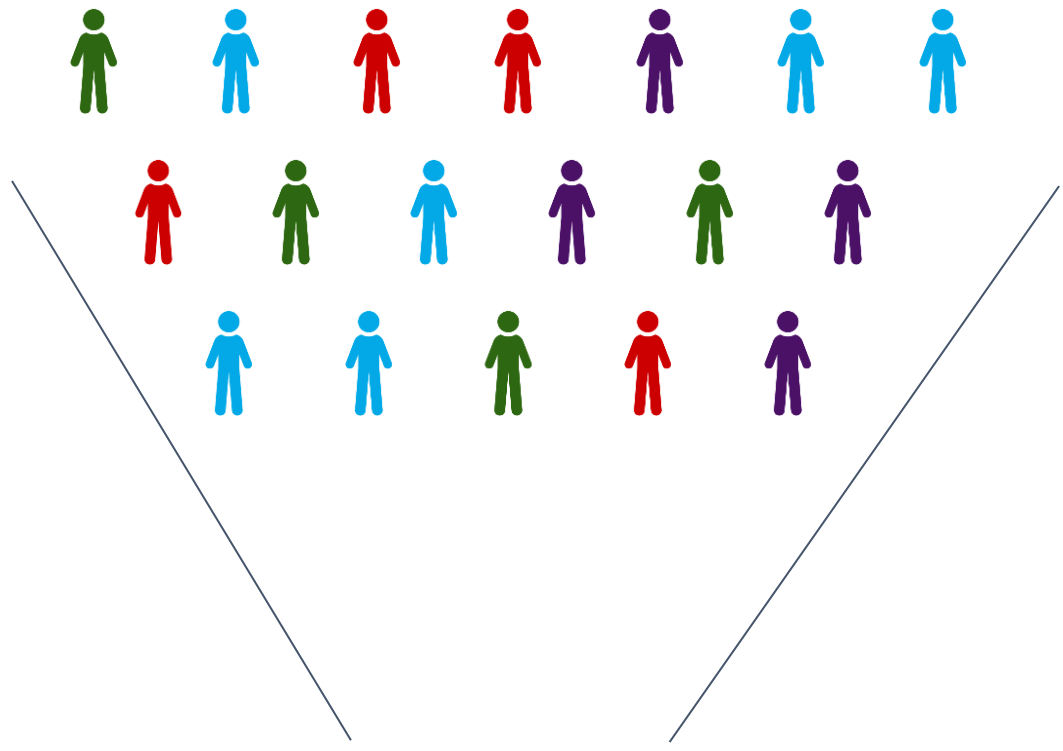


“Show me - someone like me - using your product with fidelity”

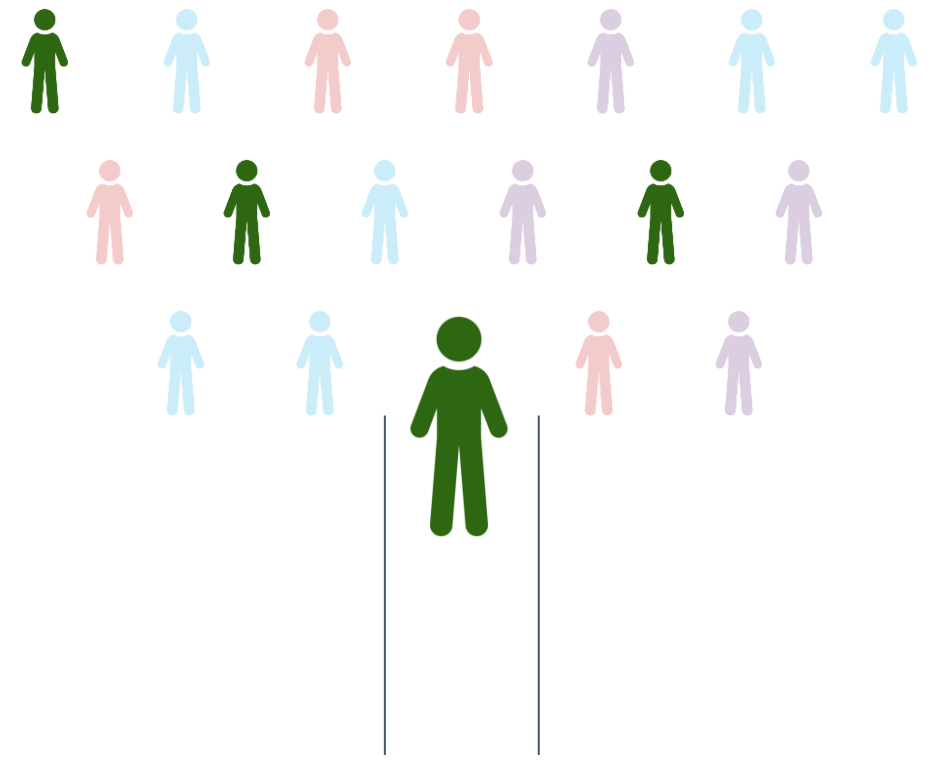
- Typical Buyer



Develop Customers, not Products



Solutions looking for Problems



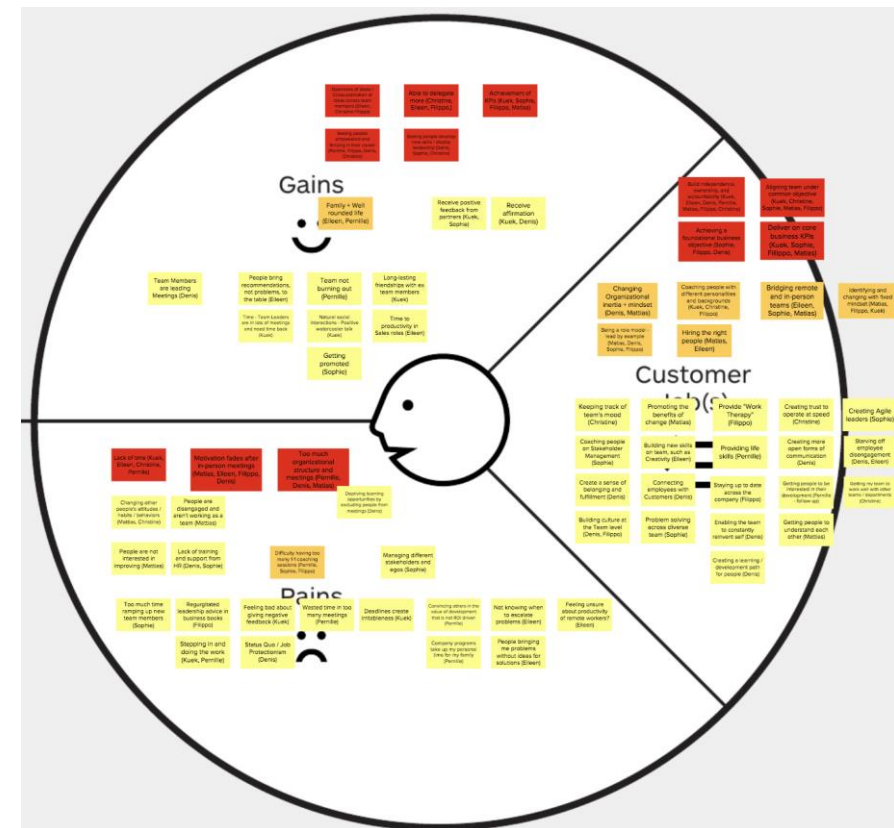
Customer-focused Company



Case Study: Team Development Platform

Lesson: Identify customer segments with acute problems

- Product:** Comprehensive platform for team development
 - Challenge: Not solving an acute problem (too ambitious)
- Approach:** Conduct research into team managers and look for more specific needs, aspirations, and points of frustration
- Result:** Identified *new managers* operating *fully-remote organizations* as a beachhead market.
 - They lack tools for having difficult conversations
 - This is an acute problem that, if addressed, leads to consideration for the broader platform.



Topic 2.1.2 Customer Segmentation

- 2.1.1 Keys to Product Market Fit
- **2.1.2 Customer Segmentation**
- 2.1.3 Product Market Fit Framework
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2.1.1

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Markets and Segmentation

- Segments are subgroups of the market with:
 - Similar needs
 - Similar characteristics
- Total Addressable Market (TAM) is the maximum revenue that could be generated by capturing an entire market
- Your Beachhead Segment is the best initial segment based on:
 - Strong need for your solution
 - Accommodating environment
 - Able and willing to purchase
- Reasons to segment the market:
 - Validate that you are solving a worthwhile problem
 - Deepen understanding of customer wants and needs
 - Identify grey space and opportunities for differentiation
 - Develop customer acquisition strategies for specific segments



Methods of Segmenting the Market

There are many different ways to segment the market based on the type of product that you are building. Below are some examples:

Attribute	
Institution's Focus Area	Key Technology Systems (<i>LMS, SIS</i>)
Institution Type (Charter, Private)	Technology Savviness
Institution Size	Technology Savviness
Locality (rural, urban)	High Staff Turnover
Socioeconomic Status	New Leadership Team
Specialized populations	Low Ratings

Tip: Identify the top attributes to segment your market based on how the customers experience the need.



Case Overview

- SuperMath (fictional company) is the leading digital math program in elementary schools in Singapore
 - The product includes core curriculum, supplemental activities, assessments, teacher resources
 - SuperMaths value-proposition is engaging content that can be customized to a school's needs
- SuperMath wants to expand into your country.

Break Out #1

- What are some relevant ways to segment the market?
- Who might be the best target customer for this product?



Topic 2.1.3 Product Market Fit Framework

- 2.1.1 Keys to Product Market Fit
- 2.1.2 Customer Segmentation
- **2.1.3 Product Market Fit Framework**
- 2.1.4 Measuring Product Market Fit



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Product Market Fit Framework

Market Segment = Same Needs + Similar Circumstances + References to Each Other

Product-Market Fit
Predictability acquiring and serving a *specific* customer segment.



Where is the problem **urgent?**
What forces are driving change?



What must be **overcome** for a successful adoption?
What can you leverage for scale and adoption?

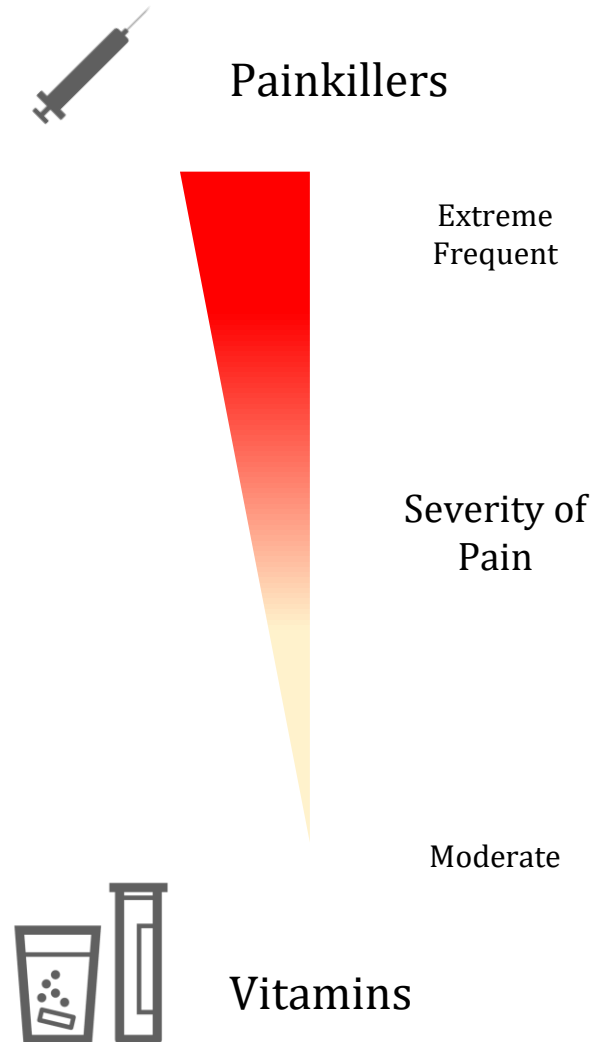


Where is funding **available** and buyers engaged?
What customer channels can be amplified?



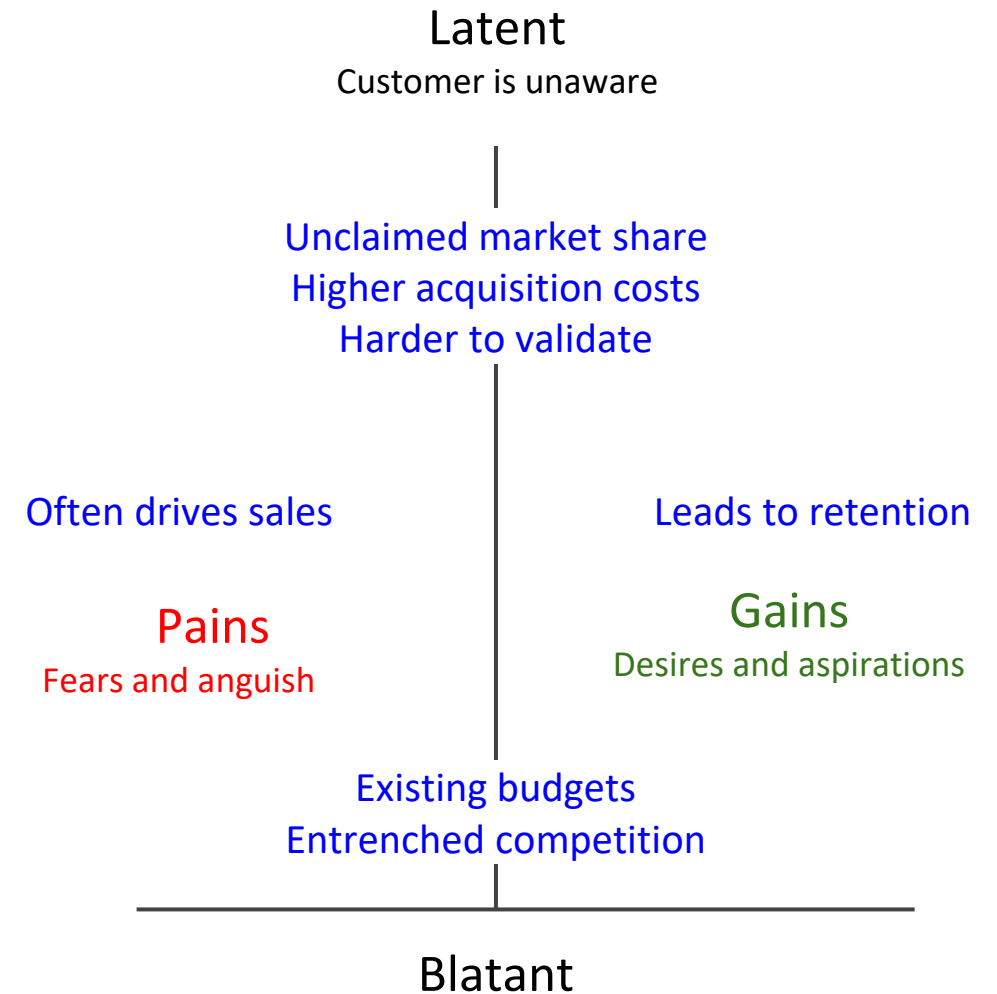
Solving Important Problems

- Customers are compelled to solve problems that are specific and important
 - Jobs to be done
- Important problems have:
 - Consequences, if remain unresolved
 - Organizational forces driving action
 - People with accountability for the problem
- Is your product a vitamin or a painkiller?



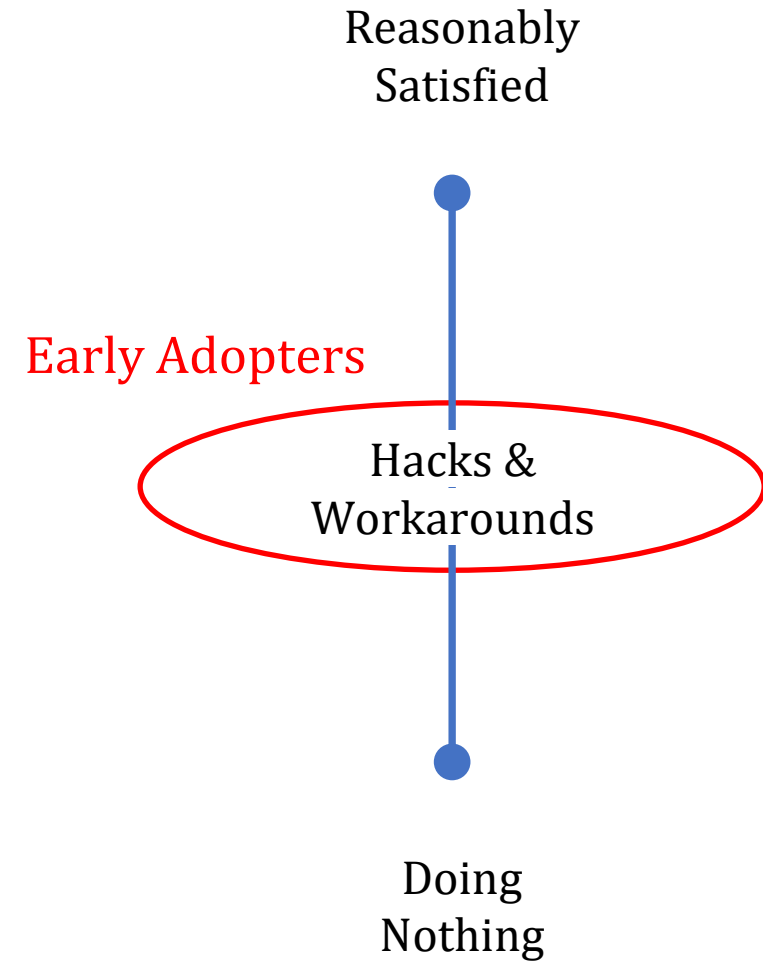
Dimensions of Customer Needs

- Customer needs can be problems (pains) or opportunities (gains) or a combination of both.
 - Customers often seek solutions to their pains.
 - Customers often become endeared with products due to the gains they create.
- Latent needs are harder to address because customers are not aware of the problem.
 - They potentially can be more fruitful as there is no incumbent.



Proving Implementation

- Solve problems that are important and that are difficult to solve today?
- Find Early Adopters
 - Customers who care enough about solving the problem that they are cobbling together workarounds to address it today.
- Ask Customers:
 - What are you doing today to solve this problem?
 - Why isn't this problem solved already?



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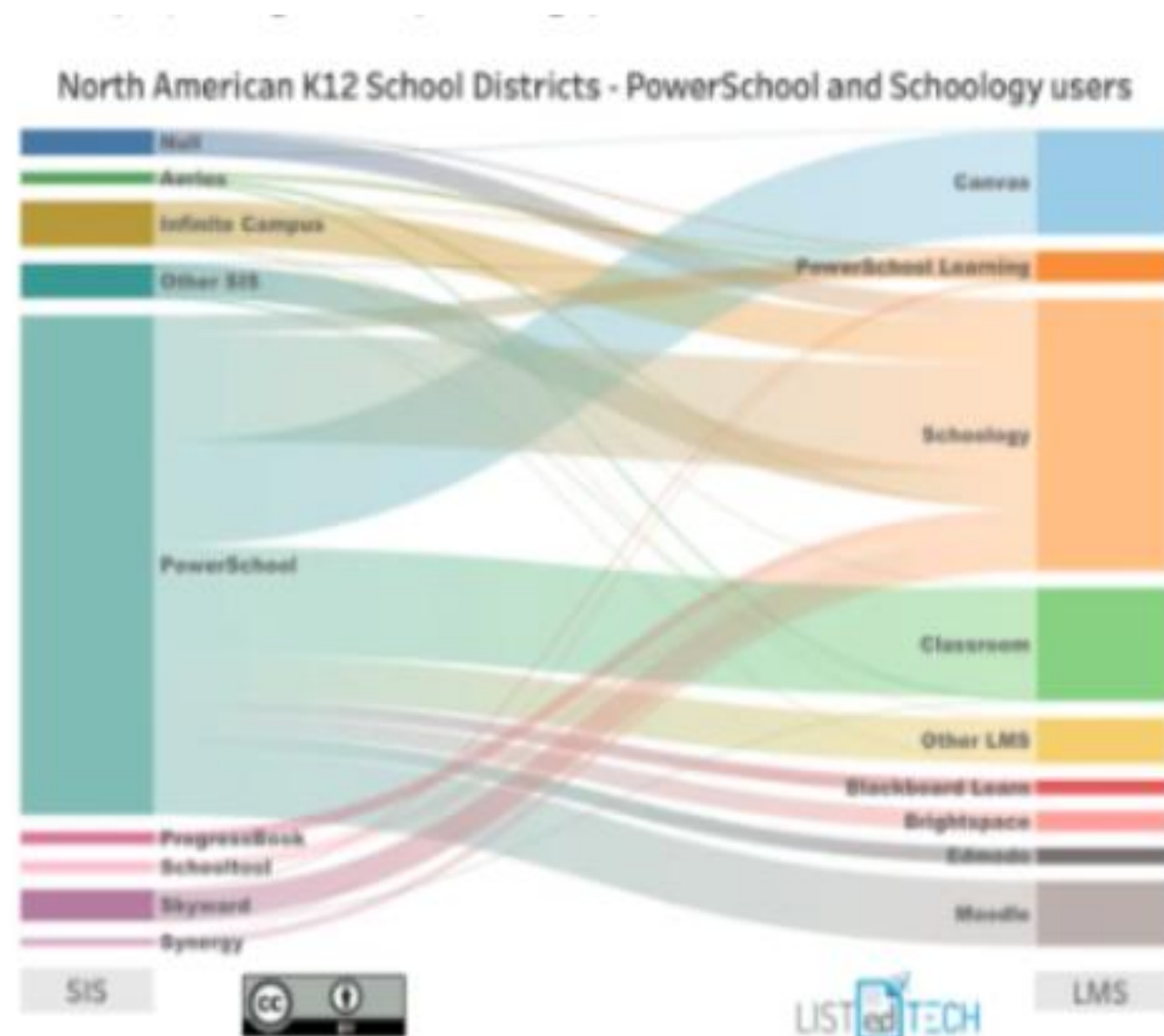
Break Out #2

- What should SuperMath learn about the customer need to validate or invalidate the opportunity?



Proving Implementation

- Institutions expect interoperability with their core identity, information, and learning systems.
 - Vary by market segment
- Identify:
 - Which systems and workflows must your product integrate with?
 - Which systems and infrastructure can your product leverage for scale?



Case Overview

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Break Out #3

- What should SuperMath learn about the customer environment to validate or invalidate the opportunity?



Go-to-market Considerations

- How much revenue per customer must you generate to accommodate for your customer acquisition costs?
- Outside sales person
 - High quota and long sales cycle
- Inside sales person
 - Significant quota and sales cycle
- Direct to consumer
 - Using search (organic and paid), social
 - Need lifetime value greater than 3 times the acquisition costs

Large District Sales

18mo sales cycle

> \$25K Deals

Building Sales

9-12mo sales cycle

> \$2K Deals

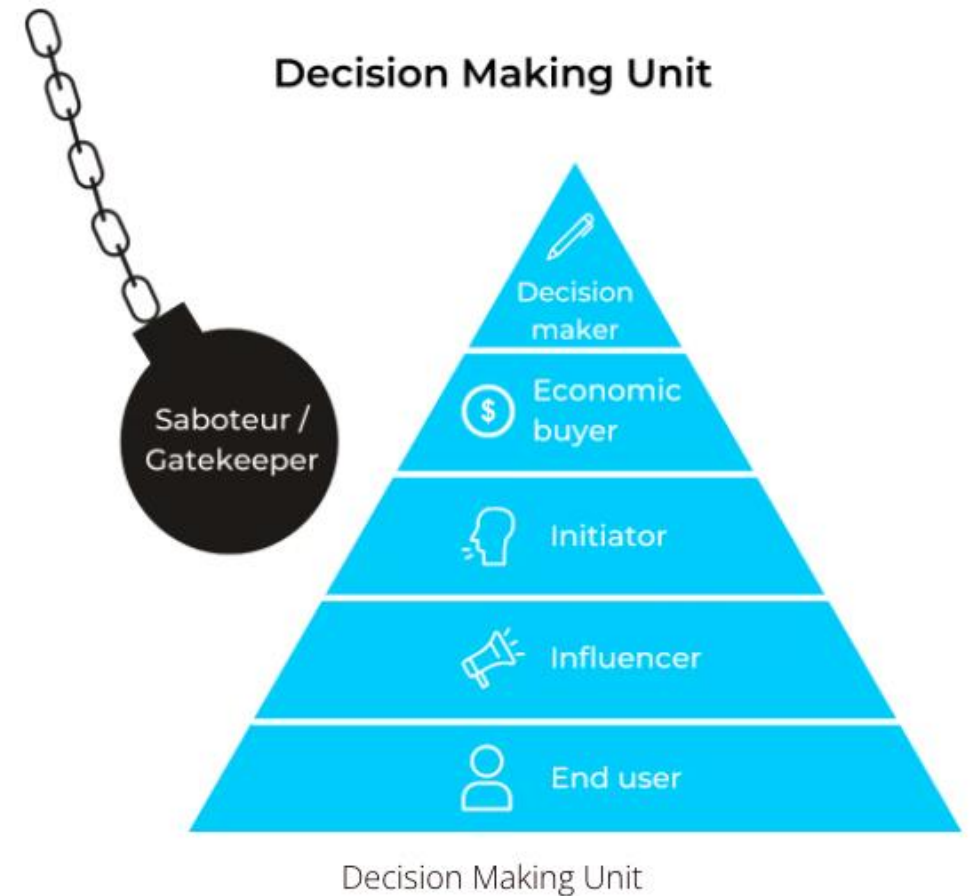
Consumer

$$\frac{\text{Lifetime Value}}{\text{Acq Costs}} > 3$$



Decision Making Units

- How are decisions made?
 - Committee?
 - Procurement process
 - Seasonal vs discretionary
- Key Roles:
 - Economic buyer is the person who controls the budget
 - Decision-makers is the person making the decision, who may or not control the budget.
 - Saboteurs must approve of decisions
 - Ex: Vendor tech assessment



What type of market are you in?

- Institutions allocate funds in categories, often tied to specific sources and goals
- It is important to understand whether the funding source is new or existing, and whether another program needs to be paused for your program to be purchased

	Market Type	Key Question	Implication
Existing Category	Are you a direct replacement for an existing solution?	Is the perceived value greater than the switching costs?	What needs to get fired for your product to be hired?
	Are you replacing some aspect of an existing solution?	Is this compatible with the other core systems?	
New Category	Are you offering a new solution?	Am I using an existing funding source?	
		Am I using a new funding source?	



Where do your customers go to learn about new ideas?

- Decision makers tend to collaborate in semi-private, regional networking groups specific to their domain
 - ex: Add EU example
- Large national conferences are often inefficient ways of targeting prospects
- Power law: 80% of success will come from one segment and channel.

Arkansas Gifted & Talented Conference (AGATE)

- G&T is required in Arkansas
- Apply for presentations with your customers



Case Overview

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Break Out #4

- What should SuperMath learn about the purchase process to validate or invalidate the opportunity?



Definitions of Product Market Fit

- “Being in a **Good Market** with a product that satisfies that market” (Marc Andreessen)
 - Large addressable market
 - Sufficient funding
- Dogs are eating the dog food
 - Problems shift to “keeping up with growth”
- You have a proven, repeatable process to acquire customers and implement your product in a customer segment

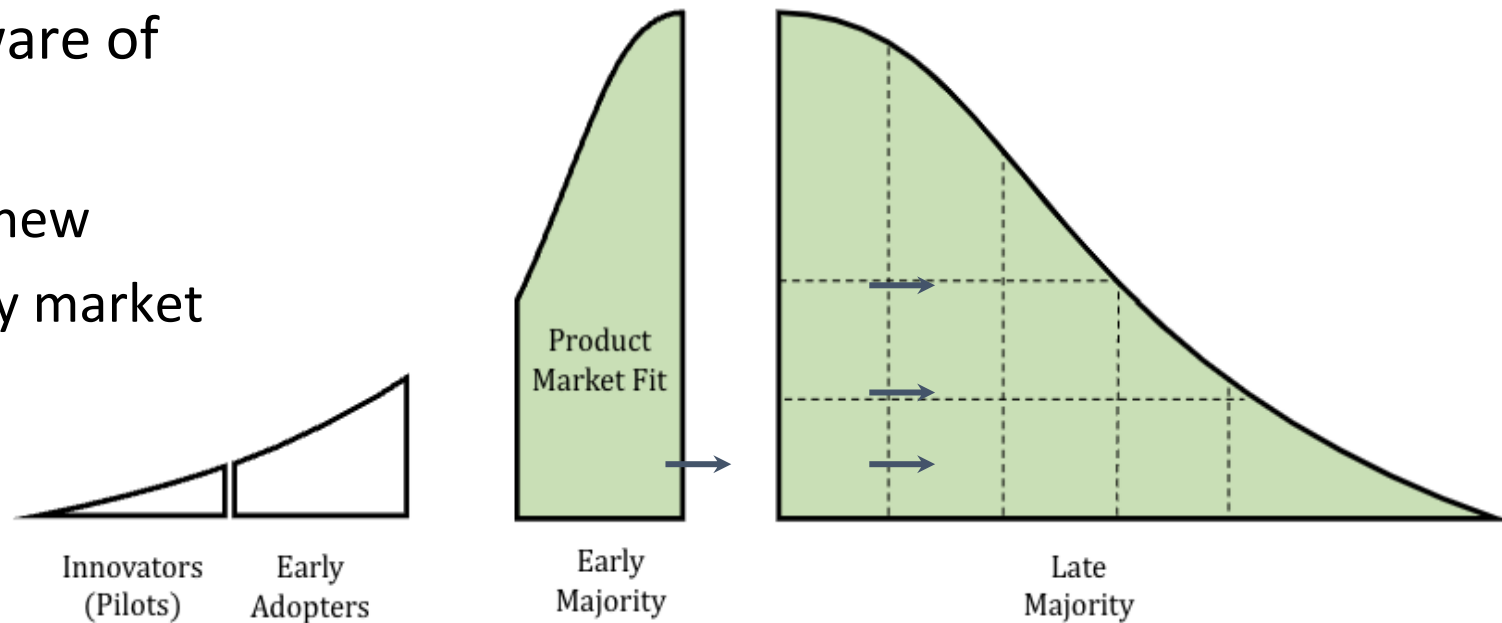
Business Model	Customers Needed
B2C (Freemium)	100+
B2C (Premium)	25+
B2School	15+
B2District	7+
Component	1+



Crossing the Chasm

- To build efficacy for your product, first activate early adopters
- Use early adopters to reach the early majority market
- The late majority may be unaware of the problem (latent need).
 - Build lighthouse customers in new segments to reach the majority market

	Early Adopter	Early Majority	Late Majority
Have the Problem	✓	✓	✓
Know they need to address the problem	✓	✓	✗
Trying to solve the problem	✓	✗	✗



Ways to measure product-market fit

Sean Ellis Test

- Survey existing customers with the following prompt: “How would you feel if you could no longer use [product]?”
 - Very disappointed
 - Somewhat disappointed
 - Not disappointed
 - N/A - I no longer use the product
- If 40% or more customers would be “very disappointed” you have product-market fit

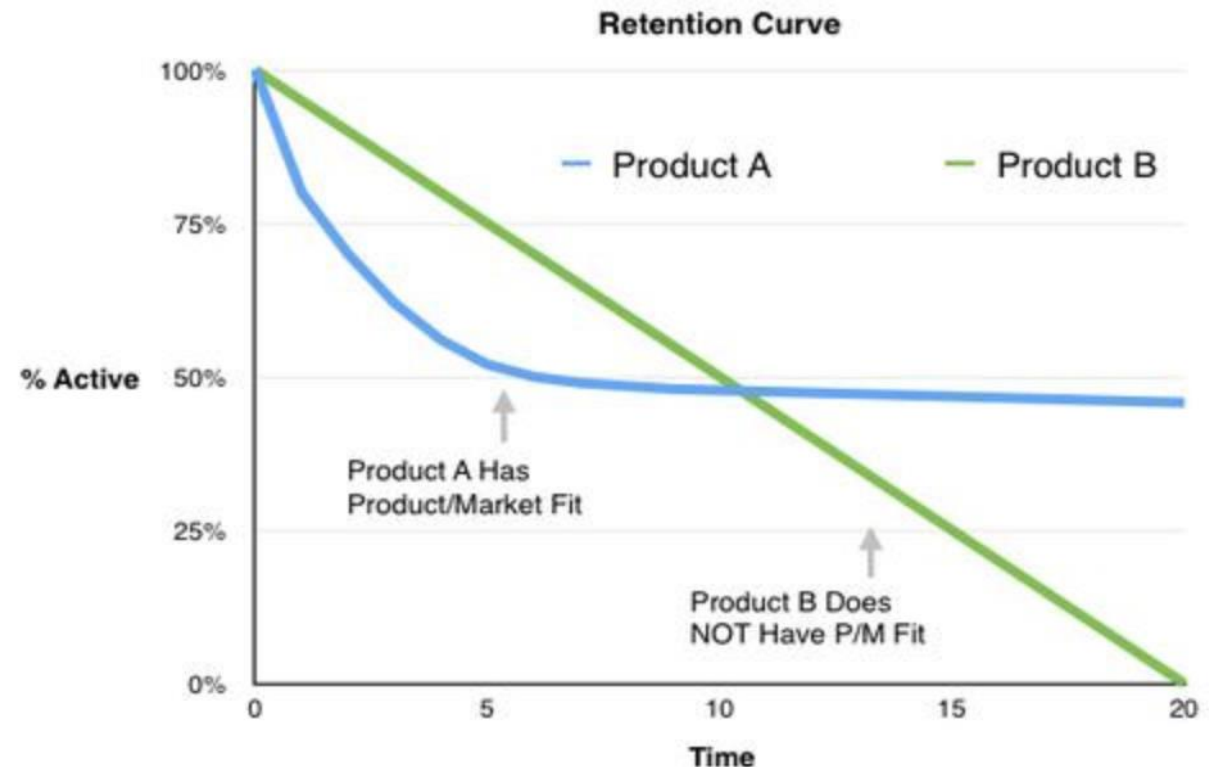
Net Promoter Score

- Survey existing customers with the following prompt: “How likely are you to refer <product> to a friend or colleague?” [scale of 1-10]
- An NPS score of 50+ is generally considered product-market fit



What does Product-Market Fit look like?

- Non-trivial revenue growth
 - It is becoming easier to acquire customers because you have accumulated reference customers and demonstrated product efficacy
- Meaningful usage
 - Users are using your product regularly and as intended
- Healthy retention curve
 - The majority of activated users stay with the program for the long-haul



Topic 2.1.4 Measuring Product Market Fit

- 2.1.1 Keys to Product Market Fit
- 2.1.2 Customer Segmentation
- 2.1.3 Product Market Fit Framework
- **2.1.4 Measuring Product Market Fit**



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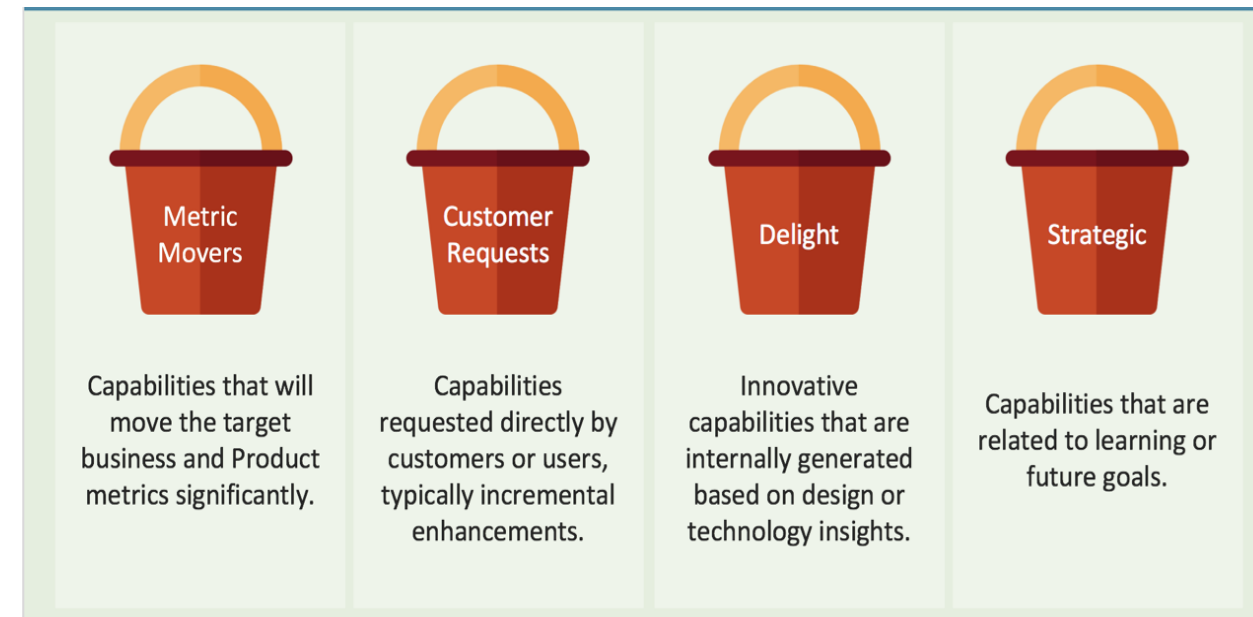
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What type of features should I build?

- **New Products:**
 - “If you are not embarrassed by your first release, you waited too long too long” (Mark Zuckerberg)
- **Early Products:**
 - What does a whole product look like?
 - Do you have healthy adoption and retention?
 - What is your key use case?
- **Mature Products:**
 - What metrics are you trying to improve?
 - Avoid feature bloat



Tool: Customer Discovery Interviews

- Interview 3-5 customers in the same market segment
 - Segment customers by type, size, location, ect.
- Don't share information about your product until first listening to the interviewee's problems
- Ask consequential questions
 - ex: "If this problem is so important, why aren't you more actively trying to solve it?"

Baseline Protocol

Customer Problems

- What are your customer's overall needs?
- What is the root cause of the problem?
- What are the forces driving the need for change?
- What are the consequences of the problem? Upside to addressing it?

Solution Impact

- How are customers trying to solve your problem today?
- Why is making progress so hard today?
- What are the desired benefits that your customers seek?
- What systems must your product connect into?
- What obstacles must your product overcome?

Go-to-market

- How much are customers willing to pay for a solution that fully addresses their needs?
- What sources of funding are viable?
- How are decisions made and influenced?
- Where do customers learn about new ideas?



Keys to Product Market Fit in Edtech

- Build customers, not products
 - “I believe many programs would work if we actually used them to fidelity” (K12 Buyers)
 - Upshot: The edtech market is an implementation challenge
- The mass market wants proof that your product works and they want to hear it from someone they trust
 - “Show me – someone like me – using your product with fidelity” (K12 Buyers)
 - Upshot: The US edtech market is a web of smaller reference networks
- Product Market Fit is reached when you’ve accumulated a meaningful number of reference customers in a specific customer segment



Case Study: Sutori

The Sutori logo is displayed in a light gray rectangular box. The word "Sutori" is written in a bold, dark gray, sans-serif font.

- Sutori is a learning environment that enables rich presentations, real-time collaboration, and fosters creative and critical thinking.
 - Sutori was founded as a single interactive story on Great Smog of 1952 for Chinese students. Initially, Sutori sought to produce a catalog of interactive stories, but learned that teachers wanted to create their own.
 - Sutori was founded with a 100,000 EU grant. In 2013, Sutori went to the US for additional funding and to attend LearnLaunch Accelerator. Thomas Ketchell, Sutori's CEO, now thinks EU has plenty more institutional funding options for edtech startups.
- Challenges and lessons learned:
 - **Challenge #1: Monetizing free teachers.** Ultimately, Sutori realized that administrators were its customer and developed a direct sales model instead of relying on teachers to bring Sutori to administrators.
 - **Challenge #2: Selling across multiple countries.** Sutori realized that countries varied greatly in their purchasing structures and needs (bottoms up, top down). Thomas recommends finding an initial market with approachable customers, and establishing strong reference customers to expand market share.
- Advice to founders:
 - "Search for grants to get started" Thomas recommends looking first for local grants and then the EU for grant-based funding.
 - "Figure out the problem you are solving, and the target customer, and nail it down... the best way to do that is to talk with customers ASAP. Avoid trying to please everyone, operate across too many segments, or build too many features."



Reflection Exercise

Select all that apply

- What could Sutori have done differently upfront to identify their monetization constraint with teachers?
 - *Hint: Think about how you would use customer discovery research to investigate the need*
- Why might have Sutori been more successful early on had it chosen to focus on one market?
 - *Hint: What are the benefits of great segmentation? How does segmentation help startups reach product-market fit.*



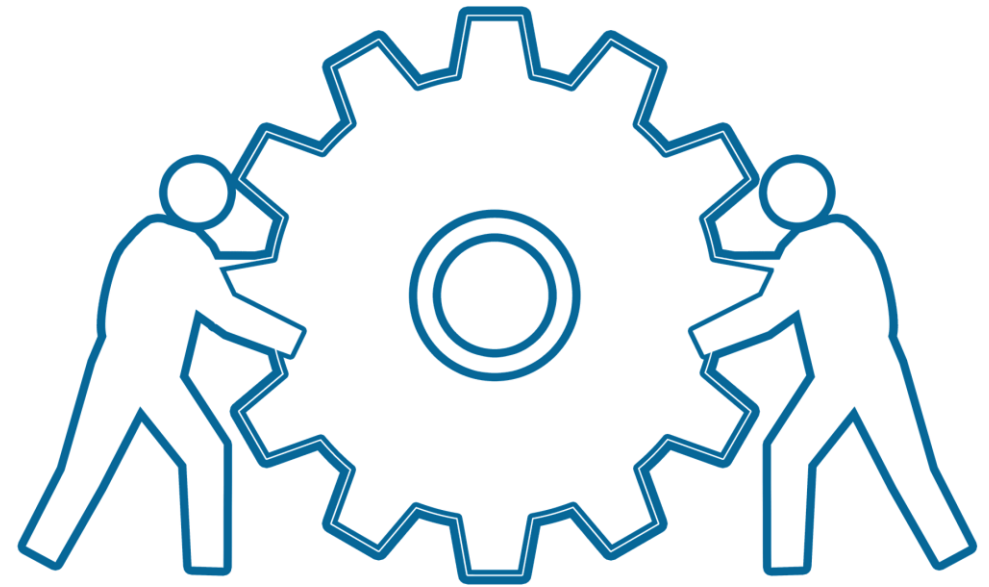
Unit 2.2

Using Proto-Personas to Guide Needs Analysis and Design of EdTech products/services

Objectives

After completing this module, you will

- ✓ recognize the importance of using proto-personas
- ✓ understand the meaning of personas and “proto-personas”
- ✓ know how to create proto-personas
- ✓ know how to use proto-personas

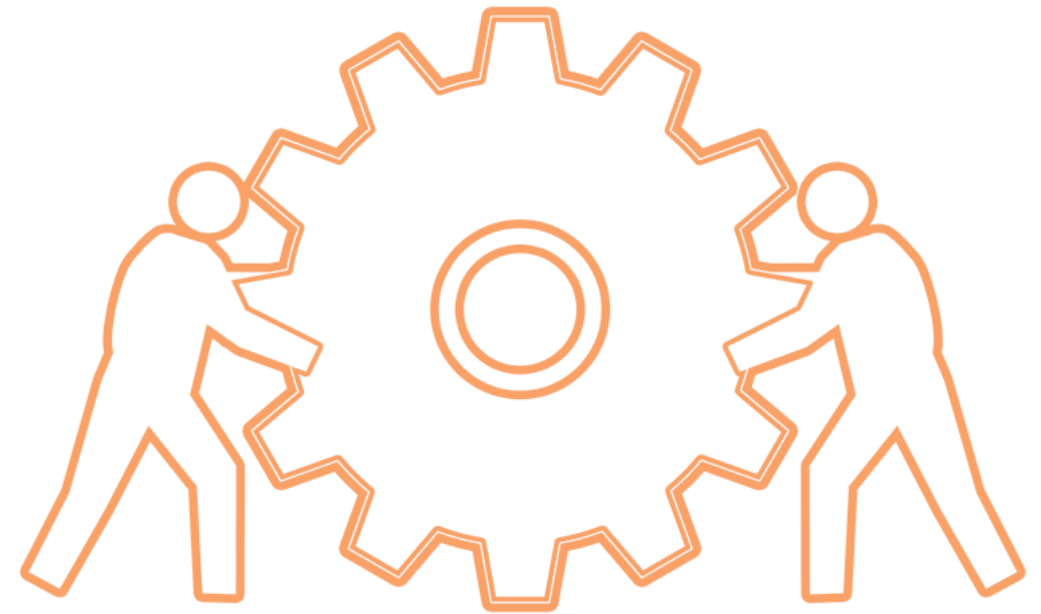


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Competences

In the end of this unit, you will

- ✓ be able to explain why it is important to use proto-personas
- ✓ be able to define/ describe what a proto-persona is
- ✓ be able to define/ describe the process for creating an effective proto-persona
- ✓ be able to distinguish the effective ways to use proto-personas in the design process



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Topics of Unit 2.2 – Using Proto-Personas to Guide Needs Analysis and Design of EdTech products/services

- 2.2.1 Why are proto-personas important
- 2.2.2 What is a proto-persona?
- 2.2.3 Steps to create proto-personas
- 2.2.4 The Case study “Find me a tutor”

2.2.1

2.2.2

2.2.3

2.2.4

Topic 2.2.1 Why are proto-personas important

- **2.2.1 Why are proto-personas important**
- 2.2.2 What is a proto-persona?
- 2.2.3 Steps to create proto-personas
- 2.2.4 The Case study “Find me a tutor”



2.2.1

2.2.2

2.2.3

2.2.4



Topic 2.2.1

Why are proto-personas important?

Objectives

In this section, you will

- reflect on how to guide the Needs Analysis and Design of EdTech products/services
- recognize the importance of using proto-personas



2.2.1

2.2.2

2.2.3

2.2.4

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Think about once...

You have an idea for an edtech product or service.

- Do you know your end users and your customers?
- Are end users your customers, i.e. the ones who will purchase your product or service?
- How do you ensure that end users' & customers' needs or desires are at the heart of your design?



The guide for the Needs Analysis and Design of your EdTech product/service

Creating customers/ end user silhouettes, when designing a new product or service, the team

- uses a common vocabulary to describe them,
- is better guided for the needs analysis and usability testing.

A user-centred development approach can save time and money by helping teams avoid creating features that their user don't need or want.



The ultimate goal

Nothing is more important than designing EdTech products/services that meet the needs of their audience.

That's why the creation of **proto-personas** becomes imperative.

Let's learn more about it.



Topic 2.2.2 What is a proto-persona?

- 2.2.1 Why are proto-personas important
- **2.2.2 What is a proto-persona?**
- 2.2.3 Steps to create proto-personas
- 2.2.4 The Case study “Find me a tutor”



2.2.1

2.2.2

2.2.3

2.2.4



Topic 2.2.2

What is a proto-persona?

Objectives

By the end of this section, you will **understand** the meaning of :

- personas, in general,
- “proto-personas”

and **be able** to

- distinguish proto-personas from personas



2.2.1

2.2.2

2.2.3

2.2.4

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Exploring Edmodo EdTech company

- Explore the following webpage from **Edmodo** EdTech company, as an example.
- What tool have they used to empathize with their different users' needs?



Exploring LearnWorlds EdTech company

- Watch the following video:



- What **the company** offers?
- Which are **LearnWorlds** value propositions?
- Take notes! Another activity follows...

- Explore the **LearnWorlds** website <https://www.learnworlds.com>

Based on its pricing policy and your notes, which customer/end user figures can you assume that **LearnWorlds** has used?

- Discuss with your teammates



What is a persona?

Personas are

- a powerful tool that supports user-centered design by focusing on users' needs.
- lifelike characters that represent potential users whose goals and characteristics reflect the needs of a larger group of users

Notes

You can get an overview of what personas are, by watching this video

<https://www.youtube.com/watch?v=W1kw5xK1C30&t=3s>



How is a persona represented?

A persona includes:

- demographics and skills,
- motivation,
- needs and goals,
- challenges

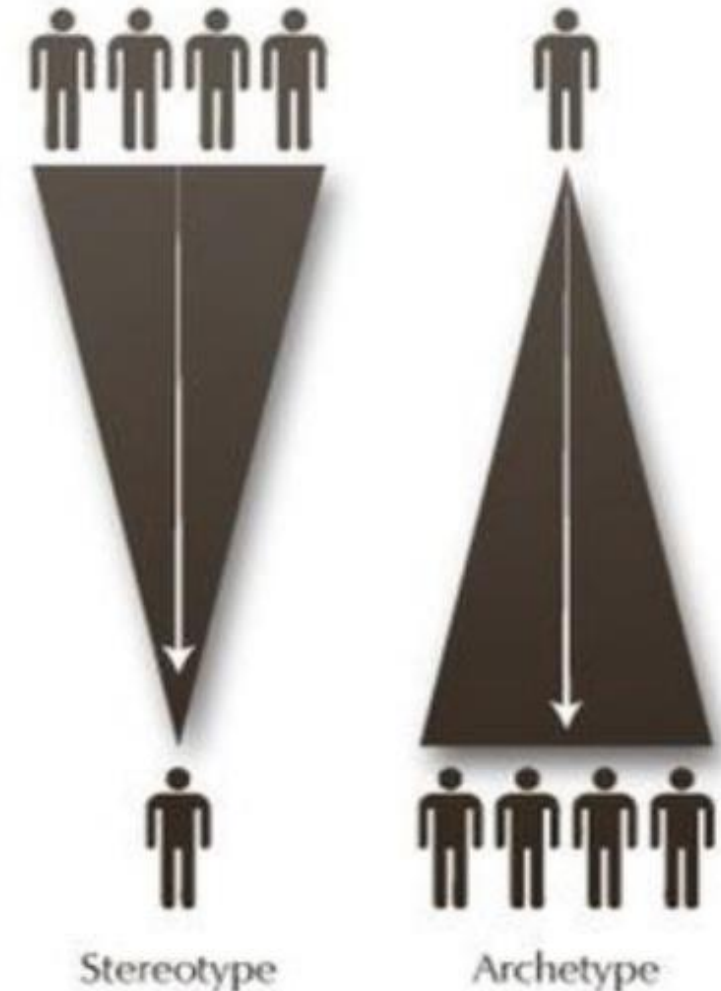
A persona is presented

- in a one or two-page document
- more realistically, if some fictional personal details are added.



Build Archetypes not Stereotypes

- Archetype: an original model of which all other similar persons, objects, or concepts are merely derivative
 - Based on data
- Stereotype: oversimplified idea of the characteristics which typify a person, based on such a preconception
 - Based on opinion



Clarifications

Personas:

- **are** combined patterns of users' behavior and motivations
- **are not** description of individuals or average information of specific groups of users.



The proto-persona

Proto-personas **are**

- a variant of the typical persona,
- what we think our user would be,
- the result of brainstorming workshops.

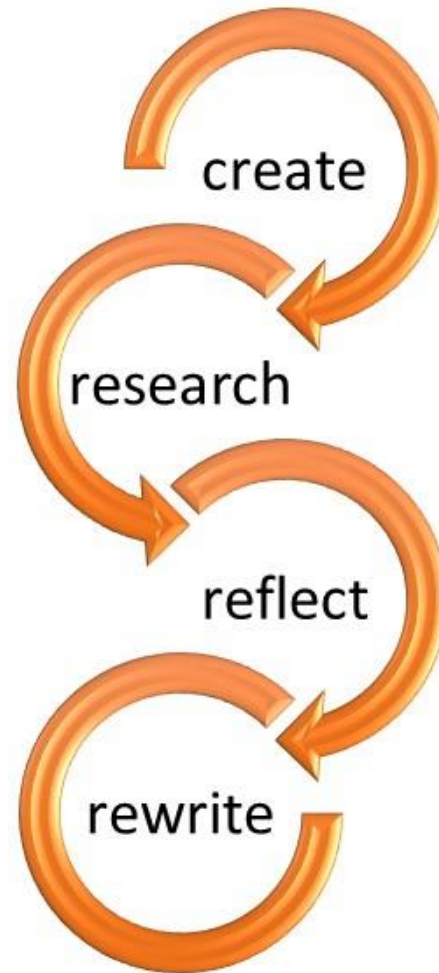
Proto-personas **are not**

- the result of user research.



Validating proto-persona

Take them into the field to begin validating their accuracy



Create and agree upon

As holes are poked into the **original persona hypotheses**, revamp and rewrite them



Keep in mind

The value in producing proto-personas derives from the exercise of producing them, which restores the **focus** of an organization back onto the customer/end user.



Examples from EdTech

- <https://edtech.worlded.org/so-why-persona/>
- <https://procreator.design/blog/ux-for-edtech/>
- <https://medium.com/edulift/how-to-create-a-learner-persona-to-boost-sales-and-student-outcomes-95c5a545a0f5>
- <https://www.digitallearninginstitute.com/blog/how-to-use-personas-for-digital-learning-design>



Topic 2.2.3 Steps to create proto-personas

- 2.2.1 Why are proto-personas important
- 2.2.2 What is a proto-persona?
- **2.2.3 Steps to create proto-personas**
- 2.2.4 The Case study “Find me a tutor”



2.2.1

2.2.2

2.2.3

2.2.4



Topic 3

Steps to create proto-personas

Objectives

By the end of this section, you will **know**

- the process for creating an effective proto-persona.



2.2.1

2.2.2

2.2.3

2.2.4

[Source](#) | [Pixabay license](#)

Where to focus

- move away from standard ways of categorizing users
- focus on who needs the product/service of your idea
- embody the key traits that are built around needs, motivations, and preferences.



Step 1 - Assumptions about users

- Identify ways the users are typically categorized.

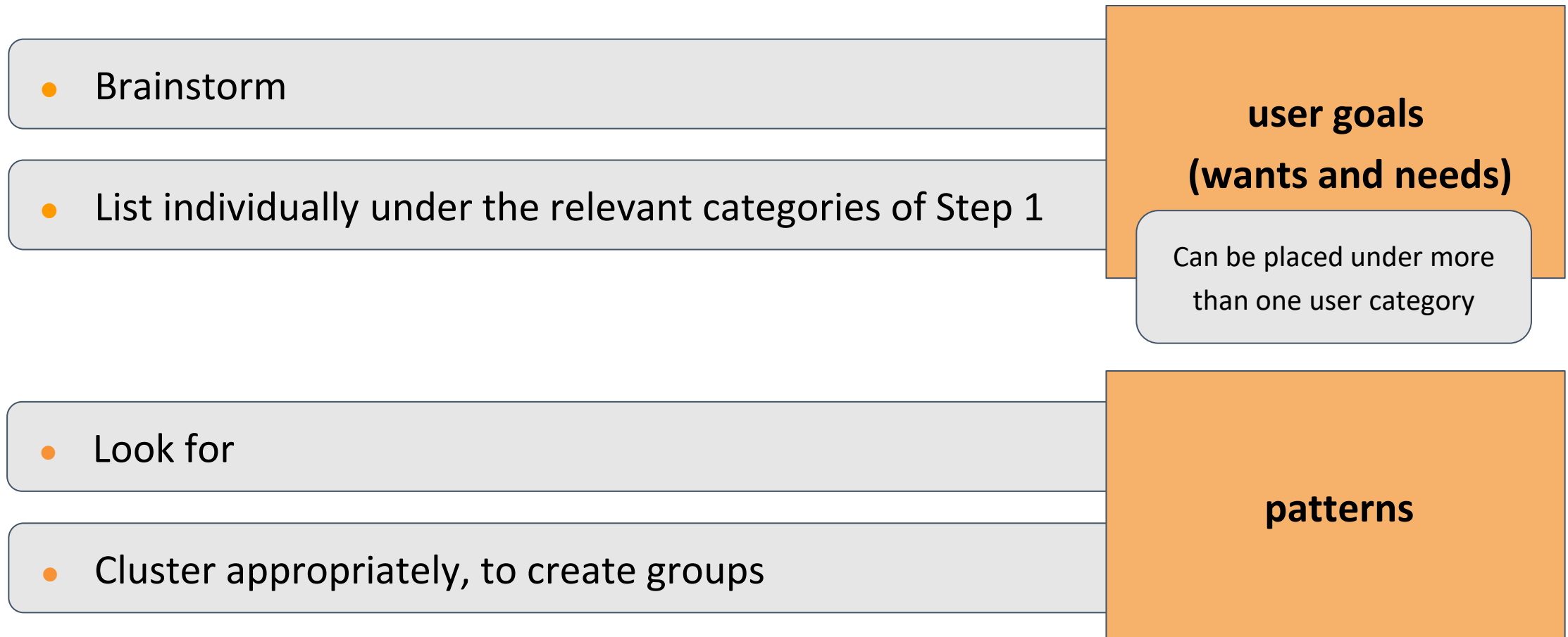
Reveal the team members' assumptions.

- Document the categories on a whiteboard or flipchart.

Gain a starting point for deconstructing stereotypes.



Step 2 - From assumptions of user categories to user goals



Step 3 - Forming skeletons

- Document the groups of goals from step 2

- Reflect

Groups of goals

- Outline a skeleton for each group

- Decide the number of skeletons you want

Skeletons



Step 4 - Forming skeletons into proto-personas

- Name each skeleton

- Create a quote

- Write short paragraphs with key aspects of motivations, challenges, goals

**Pic
& Demographics**

Who is this person?

Motivations

What does he/she care about?

Challenges

What challenges does he/she faces

Goals

What is he/she trying to accomplish?



What's next?

Creating proto-personas

guides the team to initial product decisions,

but then...

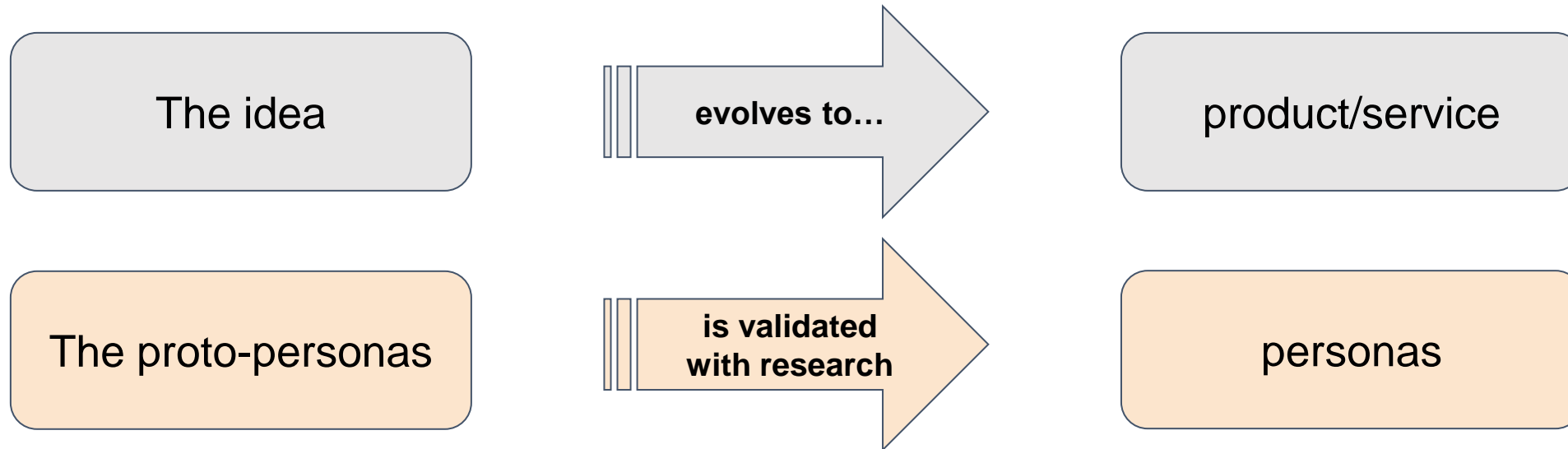
you must go out and validate your assumptions, with user research!

Remember!!!

The main difference between Personas and Proto-Personas is the lack of background research and study when considering proto-personas.



Building better personas



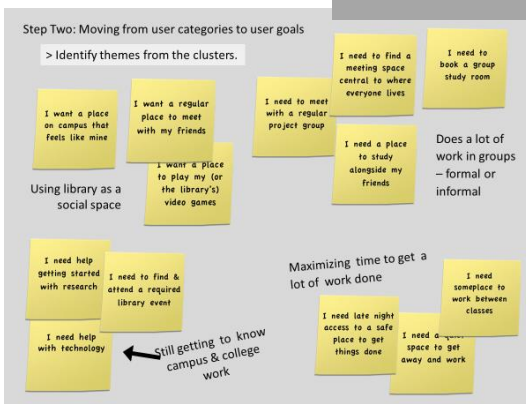
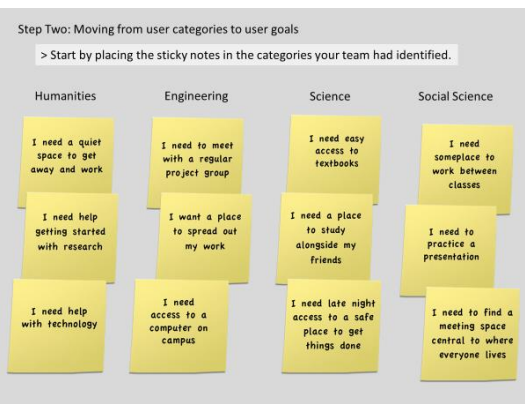
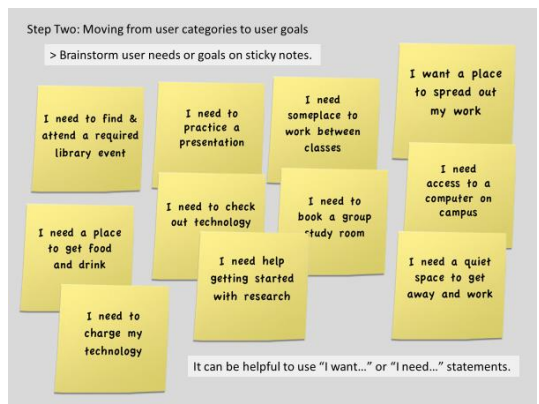
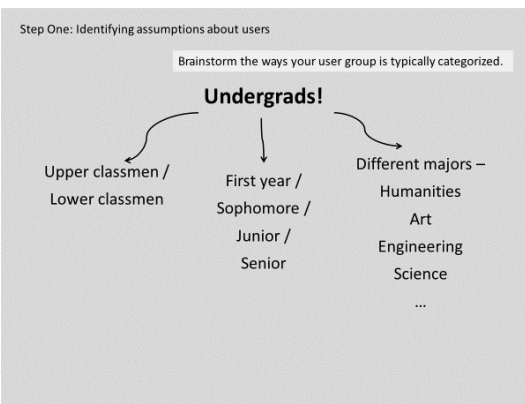
**By building better personas,
your idea for the EdTech product/service
will evolve
to always better serve the needs of your
customers/users.**



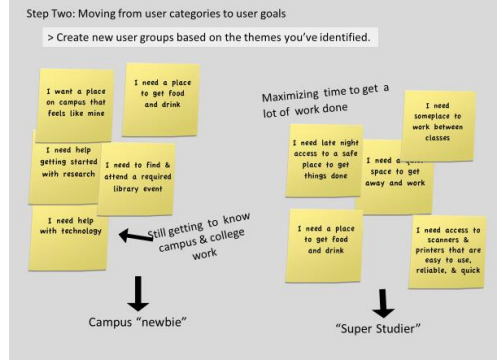
2 Product Market Fit & Evidence-based practices

2.2 Using Proto-Personas

2.2.3 Steps to create proto-personas?



5. create groups of goals



1. reveal assumptions

2. identify user goals

3. List individually under the relevant categories of Step 1

4. look for patterns of goals

Check the process in an interactive video: <https://youtu.be/FxsCtfJEHBs>



7. develop proto-personas

6. form skeletons and prioritize



Topic 2.2.4 The Case study “Find me a tutor”

- 2.2.1 Why are proto-personas important
- 2.2.2 What is a proto-persona?
- 2.2.3 Steps to create proto-personas
- **2.2.4 The Case study “Find me a tutor”**



2.2.1

2.2.2

2.2.3

2.2.4



Topic 4

The Case study “Find me a tutor”

Objectives

By the end of this section, you will **be able** to

- identify assumptions about user groups,
- categorize user groups based on needs,
- identify basic skeletons for personas based on core needs, values.



2.2.1

2.2.2

2.2.3

2.2.4

Hands-on activity on proto-personas creation

Here is a new business idea in the EdTech sector.



The marketplace where students and teachers match their needs.



Find me a Tutor



University of Piraeus
Department of Digital Systems



Hands-on activity on proto-personas creation

- Your task is to follow the steps of the previous unit, in order to create proto-personas for “Find me a Tutor” EdTech business idea.



The marketplace where students and teachers match their needs.



Find me a Tutor



University of Piraeus
Department of Digital Systems

1



Activities you should complete

- Share your proto-personas with your classmates.
- Check the work of other participants.
- Comment on some other participants work.



The marketplace where students and teachers match their needs.



Find me a Tutor



1



A step further

- If you want to step further in the process of validating your proto-personas, you can go on with researching the market, using questionnaires....



The marketplace where students and teachers match their needs.



Find me a Tutor



1



References and further reading

- Cooper, A., Reimann, R., Cronin, D., & Noessel, C. (2014). *About face: the essentials of interaction design*. John Wiley & Sons.



Sample Persona



Age: 32

Occupation: Grade 10 Science Teacher

Location: Philadelphia, PA

Tenure: 5 years

Archetype: Explorer

Traits

- Risk-taking
- Open & Communicative
- Comfortable with technology
- Positive
- Innovative in the classroom

Motivations

- Seeing students succeed in their educational journey in and out of the classroom is rewarding
- Making an impact on students' lives
- Developing her craft! She genuinely enjoys teaching her subject matter and her students

Goals

- To showcase a student's growth over time
- To assess the whole student
- To develop, document, and communicate 21st Century Skills
- To engage both parents and students in the learning process
- Allow students to achieve their personal goals rather than push them towards a set trajectory

Frustrations

- Lacks the time to provide personalized student learning and feedback
- Struggles to document student learning and work over time
- Lacks support and training internally and externally for new technology
- Has difficulty connecting and engaging with parents

Technology

- Google Classroom (power-user)
- Remind App
- Twitter, Instagram
- 3+ tools a year

Quotes

"I've had the opportunity to take what may be easier teaching jobs, but I've chosen to stay at a school where I can have the most impact on students."

"I try to stay pretty up to date on new technologies. I like to find new things to do with my students to help them learn and grow."

"I can't call every parent or comment on every assignment, but I wish I could."

Concluding...

In the process of creating proto-personas it is advisable to

- make assumptions about users
- Brainstorm about users goals
- group users needs and wants
- form 7-10 skeletons
- write short paragraphs with a name, characteristics, needs and motivation following a standardized template.

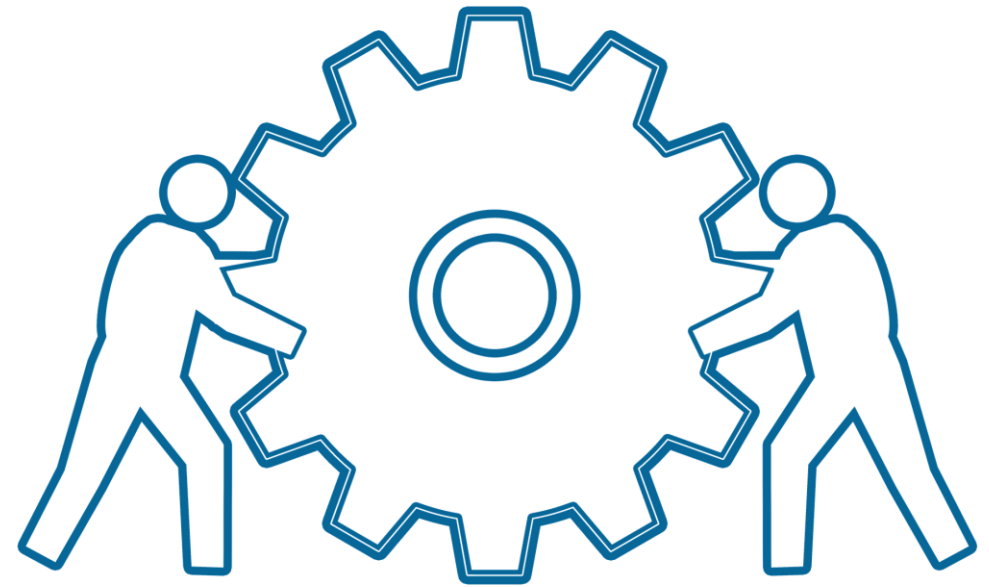


Unit 2.3

Evidence-based Practices of Ed Tech products

Objectives

- ✓ Participants in this module should be aware of the need for evidence in generating ideas.
- ✓ The participants should know the possibilities of usability evaluation and know when to start UX research into which categories this research is divided.
- ✓ Participants should be able to use impact research to answer cause-and-effect questions.



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Topics of Unit 2.3 – Evidence-based Practices of Ed Tech products

- 2.3.1 Using evidence for ideation
- 2.3.2 Usability Evaluation & UX Research
- 2.3.3 Evaluation of Impact
- 2.3.4 Concluding remarks

2.3.1

2.3.2

2.3.3

2.3.4

Topic 2.3.1 Using evidence for ideation

- **2.3.1 Using evidence for ideation**
- 2.3.2 Usability Evaluation & UX Research
- 2.3.3 Evaluation of Impact
- 2.3.4 Concluding remarks



2.3.1

2.3.2

2.3.3

2.3.4



The agony of choice...

- When it comes to choosing the best educational technology tools for students, educators face an oversupply.
- With approximately **8,000 educational technology tools** in use and **3,250 educational technology companies**, the market is now crowded.
- The choices are too numerous and there are few ways to get useful information about what really works and what doesn't.



Urban legends in education

There are many urban myths around effective methods for education:

- Digital Natives
 - Learning styles
 - Etc.
-
- The opposite of building on beliefs and common misconceptions would be to focus on evidence. This is *called evidence-based practice*.



What is evidence?

- “Evidence refers to any knowledge based on analysis, observation, or experience that is as reliable and relevant as possible to the practical problems of education”.

Nesta’s Standards of Evidence framework.



Evidence based examples

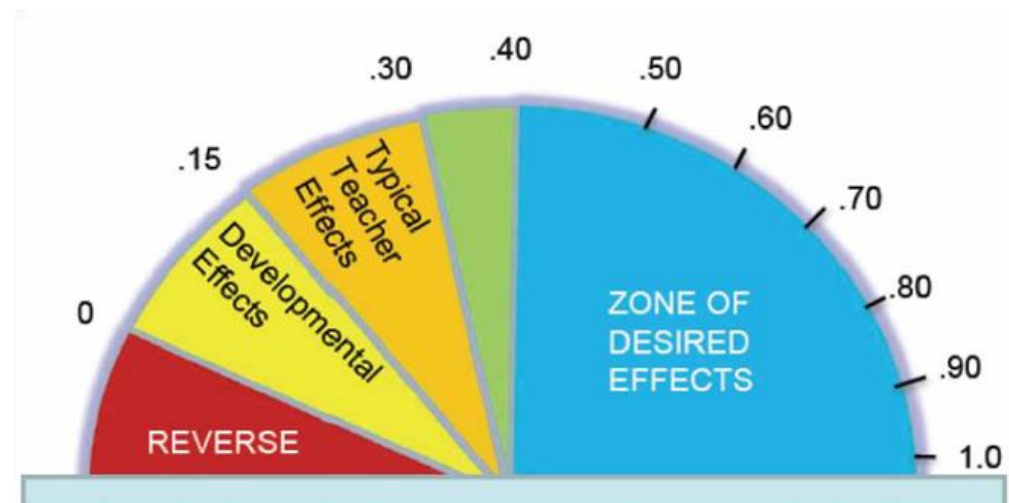
High-quality evidence of effectiveness is offered for example on three reliable, publicly accessible evidence platforms.

- EVIDENCE for ESSA
- What Works Clearinghouse WWC
- Education Endowment Foundation



Sources for evidence

- Metaanalysis and literature reviews
 - Educational research review/Review of educational research
- Publications by specific national institutions for identification of evidence
- Visible learning approach (Hattie)



Evidence-based practices across ed tech

- **Product Design & Development:** Use of evidence-based approaches for prototype development. Usability Evaluation and UX research findings for gathering user feedback and experiences to assess how implementation is going and to identify potential course corrections.
- **Roll-out:** Conducting short-cycle efficacy trials to gather data that builds a case to support your product's ability to solve the education problem or dilemma you're attacking.
- **Scale-up:** Once the EdTech implementation has stabilised and is being scaled up, the implementer should conduct a rigorous impact evaluation to assess the impact of the product on student learning outcomes.⁷



Evaluation methods and process status



Different types of impact evaluation

- when in process: development vs. implementation
- style of evaluation: laboratory vs. field
- how objective: subjective vs. objective
- type of measures: qualitative vs. quantitative
- level of information: high level vs. low level
- level of interference: obtrusive vs. unobtrusive
- resources available: time, subjects, equipment, expertise



1. Identifying evidence for ideation

- Identifying research results from meta-analysis and literature reviews to transfer findings into products
 - **Example 1:** Applying multimedia-theory for combining different media in a prototype
 - **Example 2:** Applying principles of cognitive psychology for designing learning exercises (e.g. spaced repetition of words in a language learning app)
 - **Example 3:** Addressing concrete problems identified in research and developing a solution (e.g. identification of relevant resources).
- Judging quality of research results

Table 7.4 Variables in assessing study quality, examining external validity

<i>Dimension of quality assessment</i>	<i>Components and operational definitions</i>	<i>Measure</i>
Type of review process	Has the paper undergone peer review?	<ul style="list-style-type: none"> • Peer reviewed • Not peer reviewed (grey)
Publication type	Where is the article published? This list may vary according to the protocol	<ul style="list-style-type: none"> • Academic journal • Professional journal • Book or book chapter • Doctoral dissertation
Publication date	When was the article published?	<ul style="list-style-type: none"> • Before 2000 • 2000 and later
Journal impact factor, for prestige, where 5 is highest	What is the current impact factor of the journal in which the paper is published?	<ul style="list-style-type: none"> • 0–1.0 • 1.1–2.0 • 2.1–3.0 • 3.1–4.0 • 4.1–5.0

Source: Adapted from Mak et al. (2007)

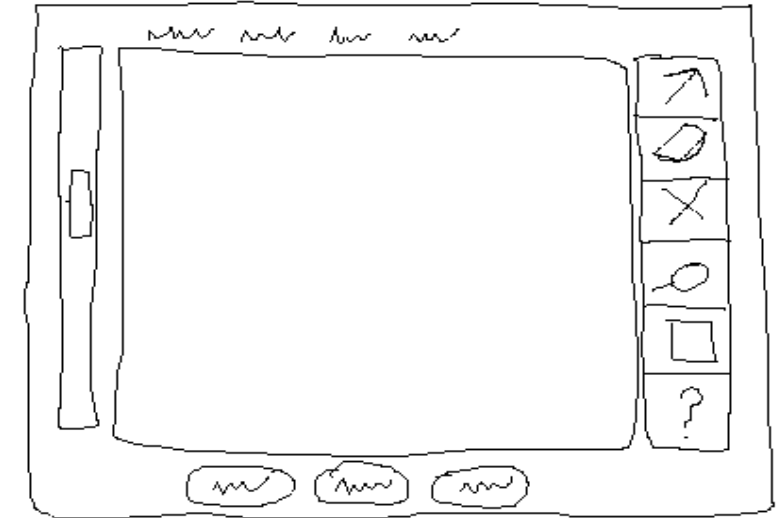


1. Identifying evidence for ideation

- Iterative approach, multiple prototypes at the same time:
<https://hci.stanford.edu/research/prototyping/>
- Getting feedback in early stages of development: From low fidelity to high fidelity prototyping

<http://grouplab.cpsc.ucalgary.ca/saul/681/1998/prototyping/survey.html>

- Focus: Ideation, diversity of ideas, multiple solutions, disagreement, feedback often qualitative



Topic 2.3.2 Usability Evaluation & UX Research

- 2.3.1 Using evidence for ideation
- **2.3.2 Usability Evaluation & UX Research**
- 2.3.3 Evaluation of Impact
- 2.3.4 Concluding remarks

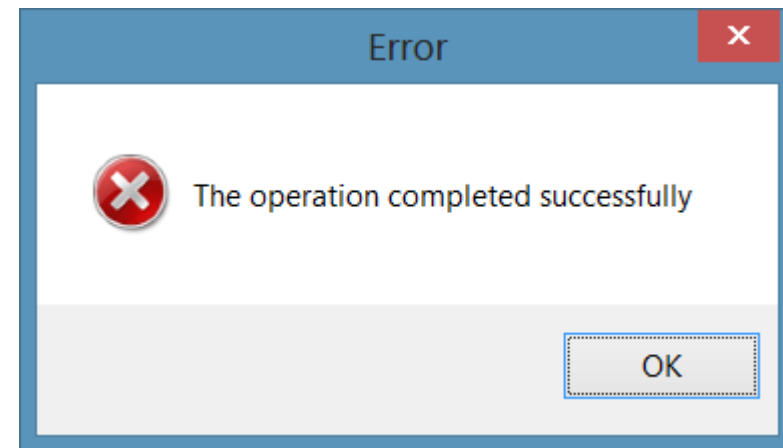


2.3.1
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Improvement: Ensuring that a prototype is usable

- Orientation in heuristics for interface-design



Improvement: Ensuring that a prototype is usable

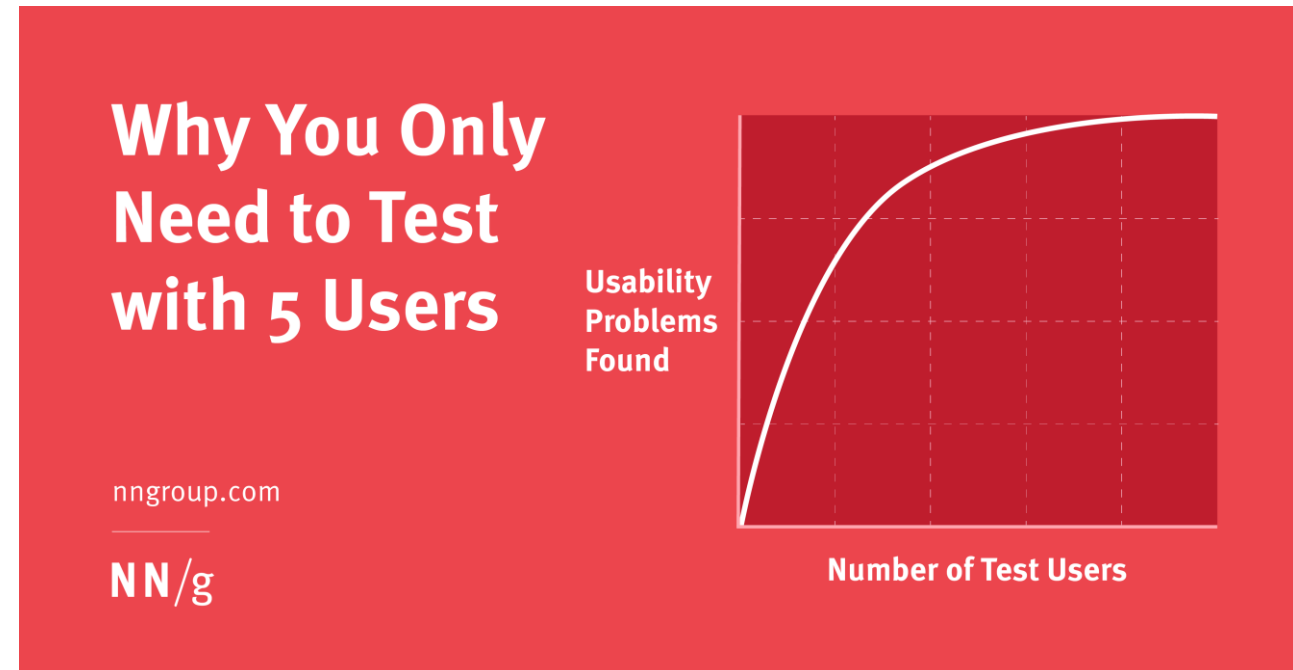
10 heuristics for interface design (Nielsen):

1. Visibility of system status
2. Match between system and real world
3. User control and freedom
4. Consistency and standards
5. Error prevention
6. Recognition rather than recall
7. Flexibility and efficiency of use
8. Aesthetic and minimalist design
9. Consistency and standards
10. Error prevention



Improvement: Ensuring that a prototype is usable

- Usability testing is initially cheap:
 - 5 users are enough to identify 80% of usability issues



Usability Evaluation Basics

- How well users can learn and use a product to achieve their goals is important in evaluating usability.
- It also relates to how satisfied users are with the process.
- A variety of methods are used by practitioners to gather this information.
- Evaluation should occur continually through the design and implementation process.



What is Usability?

- Usability refers to the quality of the experience a user has when interacting with products or systems
- It's about effectiveness, efficiency, and overall user satisfaction in the user experience.



Why should we conduct usability activities?

- Learning about users
- Learning the business environment
- Task and information analysis
- Evaluating designs in progress
- Evaluating usability results



Formative or summative evaluation?

Formative Evaluation:

Designs evaluated as you go along.

- Evaluation of the interaction design to find usability problems to fix to improve usability
- Early and continual
- Should have something to evaluate no later than 10% into a project schedule
- Carefully selected participants

Summative Evaluation:

- Conducting full evaluation at the end of design
- Evaluation of interaction design to assess level of usability
- Often used for comparison with previous versions, or with another system



Usability categories

Usability testing is often divided into four categories, based on their goals.

- 1. Exploratory Research:** Understand users and context; Early in project; How often: Once; 6-12+ users, Blend of interview and observation; May use competitive products
- 2. Benchmark Metrics:** Establish baseline metrics; Early in project; How often: Once; 8-24 users; Focus on metrics for time, failures, etc.; Tests current process or product

- **Diagnostic Evaluation:** Find and fix problems; During design; Done iteratively; 4-8 users; Less formal; Focus on qualitative data
- **Summative Testing:** Measure success of new design; At end of process; How often: Once; 6-12+ users; More formal; Metrics based on usability goals; Users unassisted



Usability factors

Usability is not a single, one-dimensional property of a system, interface, or product but rather a combination of factors.

- **Intuitive design:** a nearly effortless understanding of the architecture and navigation of the site
- **Ease of learning:** how fast a user who has never seen the user interface before can accomplish basic tasks
- **Efficiency of use:** How fast an experienced user can accomplish tasks
- **Memorability:** after visiting the site, if a user can remember enough to use it effectively in future visits
- **Error frequency and severity:** how often users make errors while using the system, how serious the errors are, and how users recover from the errors
- **Subjective satisfaction:** If the user likes using the system



Usability evaluation methods

The development of user-friendly products or systems lies in user-centered design. When it comes to usability testing, one should test as early and often as possible. A variety of methods are available for this purpose.

Opportunities for testing include:

- Baseline usability testing on an existing site
- Focus groups, surveys or interviews to establish user goals
- Card Sort testing to assist with IA development
- Wireframe testing to evaluate navigation
- First click testing to make sure your users go down the right path
- Usability testing to gauge the user interaction end-to-end and
- Satisfaction surveys to see how the site fares in the real world.



Working with Data from Usability evaluations

Two types of data can be recorded:
quantitative and **qualitative**.

What actually happened is recorded by quantitative data. What users thought or said is described by qualitative data.

Once the data has been collected, it should be used to:

1. **Evaluate** the usability of the product.
2. **Recommend** improvements
3. **Implement** the recommendations
4. **Re-test** the site to measure the effectiveness of your changes



Improvement: Ensuring that a prototype is usable (1)

Eyetracking example (Herder, Kärger, Drachsler & Kalz, 2010)

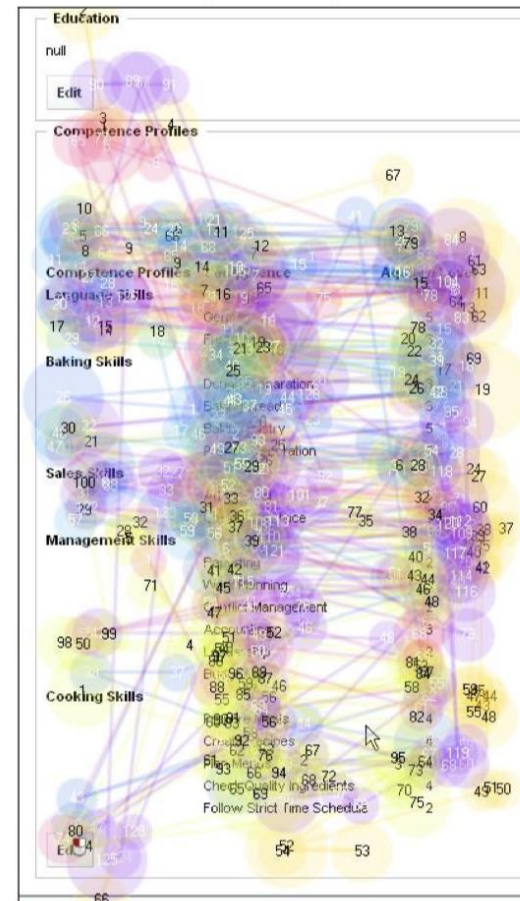


Figure 1.5. Gazeplot of the Competence profile of a user.

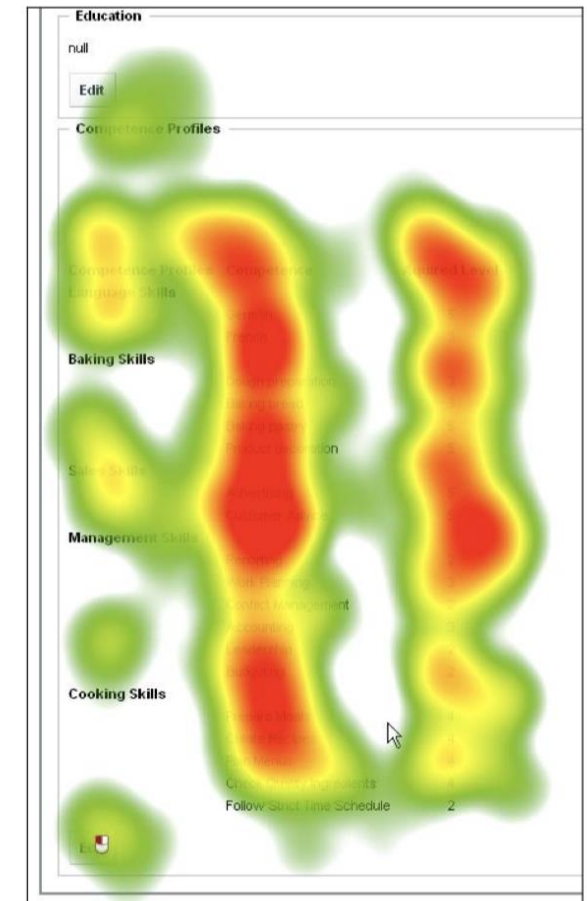


Figure 1.6. Heatmap of the Competence profile of a user.



Improvement: Ensuring that a prototype is usable (2)

Eyetracking example
(Herder, Kärger, Drachsler & Kalz, 2010)

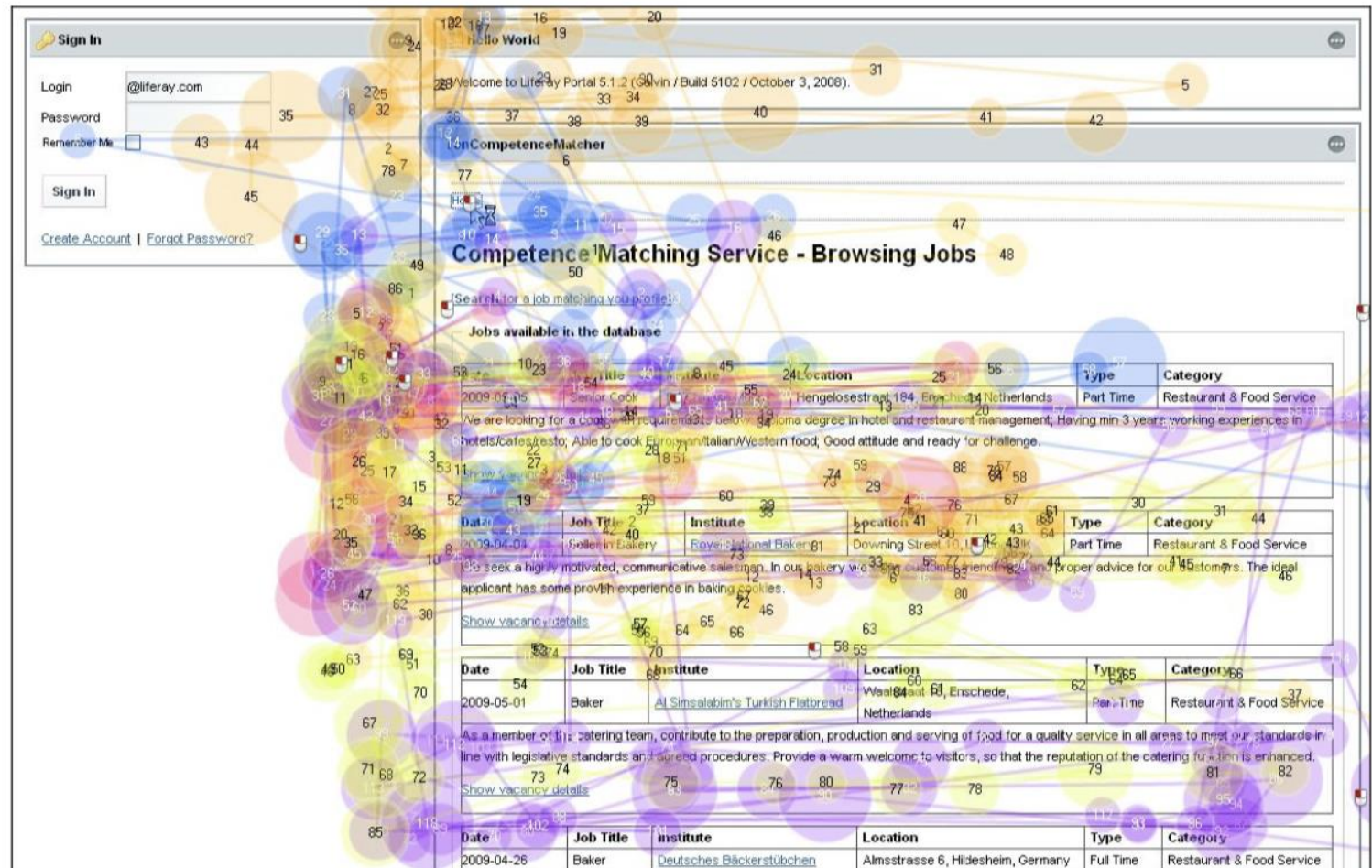


Figure 1.9. Gazeplot of the job list view.



System usability scale (SUS) (1)

- Developed 1986 by John Brooke at DEC
- Goal: Quick and dirty usability scale
- Ideally applied after testing a new prototype version out of the lab
- Simple, but valid (lots of scientific evidence)
- Factor structure confirmed: Learnability

The System Usability Scale Standard Version		Strongly Disagree					Strongly Agree				
		1	2	3	4	5					
1	I think that I would like to use this system frequently.	0	0	0	0	0					
2	I found the system unnecessarily complex.	0	0	0	0	0					
3	I thought the system was easy to use.	0	0	0	0	0					
4	I think that I would need the support of a technical person to be able to use this system.	0	0	0	0	0					
5	I found the various functions in this system were well integrated.	0	0	0	0	0					
6	I thought there was too much inconsistency in this system.	0	0	0	0	0					
7	I would imagine that most people would learn to use this system very quickly.	0	0	0	0	0					
8	I found the system very awkward to use.	0	0	0	0	0					
9	I felt very confident using the system.	0	0	0	0	0					
10	I needed to learn a lot of things before I could get going with this system.	0	0	0	0	0					

Lewis & Sauro, 2017



System usability scale (SUS) (2)

Raw SUS Score	Grade Scale	Acceptability Range	Adjective
90-100	A	Acceptable	Best Imaginable
80-90	B		Excellent
70-80	C		Good
60-70	D	Marginal	OK
50-60	F		
40-50			Poor
30-40		Not Acceptable	
20-30			Worst Imaginable
10-20			
0-10			

SUS Score	Percentile Rank	Grade
84-100	96-100	A+
81 - 83	90-95	A
79 - 80	85-89	A-
77 - 78	80-84	B+
73.9 - 76.9	70-79	B
72.4 - 73.8	65-69	B-
71.0 - 72.3	60-64	C+
64.6 - 70.9	41-59	C
62.5 - 64.5	35-40	C-
51.2 - 62.4	15-34	D
< 51	0-14	F

SUS grading on the “curve”

Adapted from Bangor et al. 2009.



System usability scale (SUS) (3)

	Mean	SD	N
Global	68.0	12.5	446
B2B	67.6	9.2	30
B2C	74.0	7.1	19
Web	67.0	13.4	174
Cell	64.7	9.8	20
HW	71.3	11.1	26
Internal SW	76.7	8.8	21
IVR	79.9	7.6	22
Web/IVR	59.2	5.5	4

B2B: Enterprise software application such as accounting, HR, CRM and order-management systems

B2C: Public-facing mass-market consumer software: Office Applications, Graphics Apps and Personal Finance Software

Web: Public-facing large-scale websites (airlines, rental cars, retailers, financial service) and intranets

Cell: Cell-phone equipment

HW: Hardware such as phones, modems and Ethernet cards

Internal SW: Internal-productivity software: Customer Service and Network Operations applications. This group likely has overlaps between the B2C and B2B groups. Because the means were different enough I kept them as separate categories.

IVR: Interactive Voice Response Systems (phone- and speech-based)

Web/IVR: A combination of web-based and interactive voice-response systems



What is UX Research?

- The systematic study of target users and their requirements in order to add realistic context and insights to design processes is called UX research (user experience research).
- To uncover problems and design opportunities, UX researchers apply various methods. The goal of this research is to gain information that can be incorporated into the design process.
- With the help of UX research, you are in a better position to offer the best possible solution to the users of their product or system, because they can find out what they really want.



When do I start doing UX research?

- UX research can be conducted at any stage of the design process. To determine user needs and motivation, one often starts with qualitative measures.
- Later in the process, quantitative measures can be used to verify the results. A structured approach to collecting user data is essential for good UX research.

When choosing a method, you should make sure:

1. that it provides the clearest information and
2. are appropriate for the purpose of your research.

Data collected can then be used to interpret and gather valuable insights.



The two subsets of UX research (1)

UX research can be divided into two subsets.

- **Qualitative research**
- **Quantitative research**



Qualitative UX research

- Using methods such as interviews and ethnographic field studies, you work to get an in-depth understanding of why users do what they do (e.g. why they feel how they do about a website).
- Another aspect of qualitative research is usability testing, to monitor (e.g.) users' stress responses.
- You should do qualitative research carefully. As it involves collecting non-numerical data (e.g., opinions, motivations), there's a risk that your personal opinions will influence findings.



Quantitative UX research

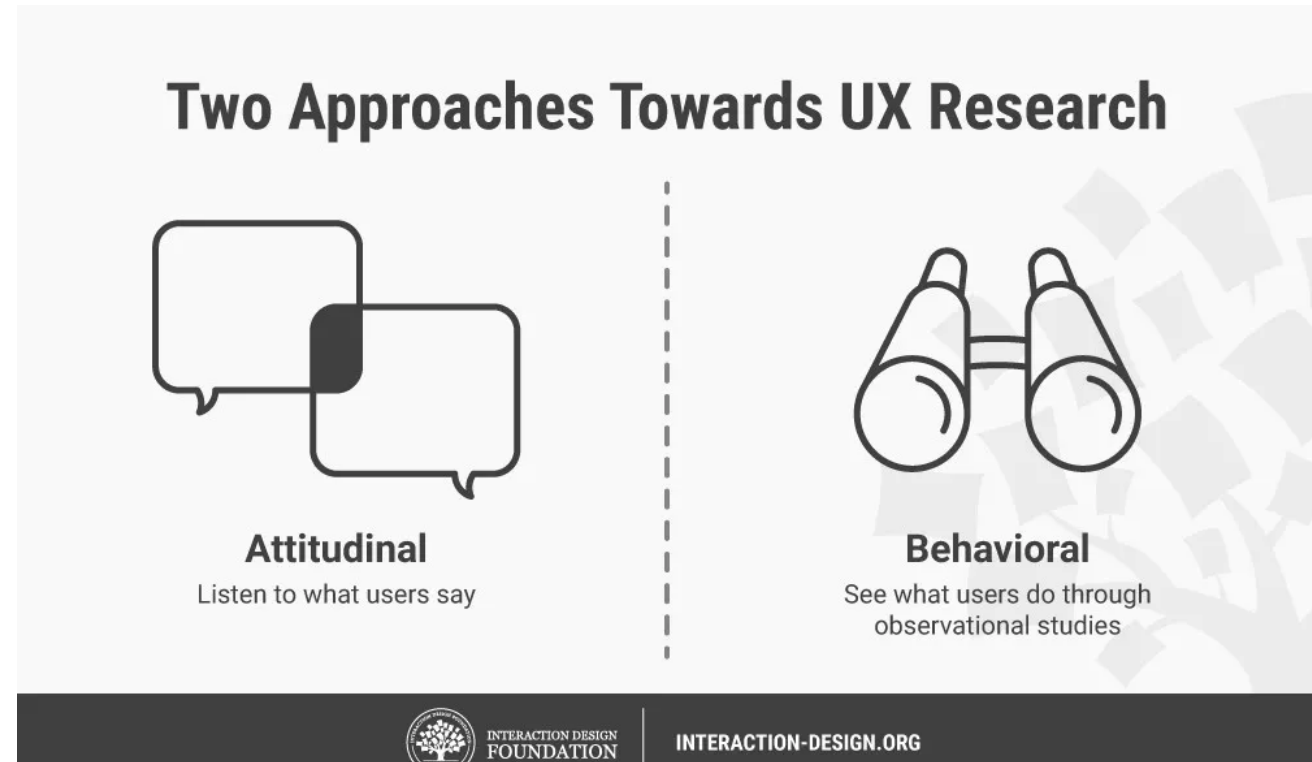
- Using more-structured methods (e.g., surveys, analytics), you gather measurable data about what users do and test assumptions you drew from qualitative research.
- With this data, you can discover patterns among a large user group. If you have a large enough sample of representative test users, you'll have a more statistically reliable way of assessing the population of target users.
- Whatever the method, with careful research design you can gather objective data that's unbiased by your presence, personality or assumptions.
- However, quantitative data alone can't reveal deeper human insights



The two additional approaches of UX research

- **Attitudinal:** you listen to what users say (e.g., in interviews)
- **Behavioral:** you see what users do through observational studies

You can achieve a clear overview of a design problem by mixing quantitative and qualitative research as well as attitudinal and behavioral approaches.



UX Research Methods

The main UX research methods are the following.

- 1. Discover:** Determine what is relevant for users (e.g. Contextual inquiries, Diary studies)
 - 2. Explore:** Examine how to address all users needs (e.g. Card sorting, Customer journey maps)
 - 3. Test:** Evaluate your designs (e.g. Usability testing, Accessibility evaluations).
 - 4. Listen:** Put issues in perspective, find any new problem and notice trends (e.g. Surveys/Questionnaires, Analytics).
- Before using UX research methods, it is important to weigh their pros and cons.
 - Some methods are more costly, time-consuming, and difficult to execute than others
 - Your available resources determine when, how much, and what type of UX research you can do



UX Research Method - Five Second Test

- One method of user research is the five-second test. It makes it possible to measure what information users take away and what impressions they get in the first five seconds of viewing a design.
- So it's about whether the user's first impression of your site is correct. This can answer the following questions.
 - What are the most important elements that you can remember?
 - Does the design/brand seem trustworthy?
 - What is the purpose of the page?
 - What was your impression of the design?
 - Who do you think is the target audience?



UX Research Method - Five Second Test example

- Perform the following test and try to remember as much as possible.

Five Second Test

- The test leads to the educational company Gostudent.
- Look at the interface for 5 seconds and remember as much as you can!



Topic 2.3.3 Evaluation of Impact

- 2.3.1 Using evidence for ideation
- 2.3.2 Usability Evaluation & UX Research
- **2.3.3 Evaluation of Impact**
- 2.3.4 Concluding remarks

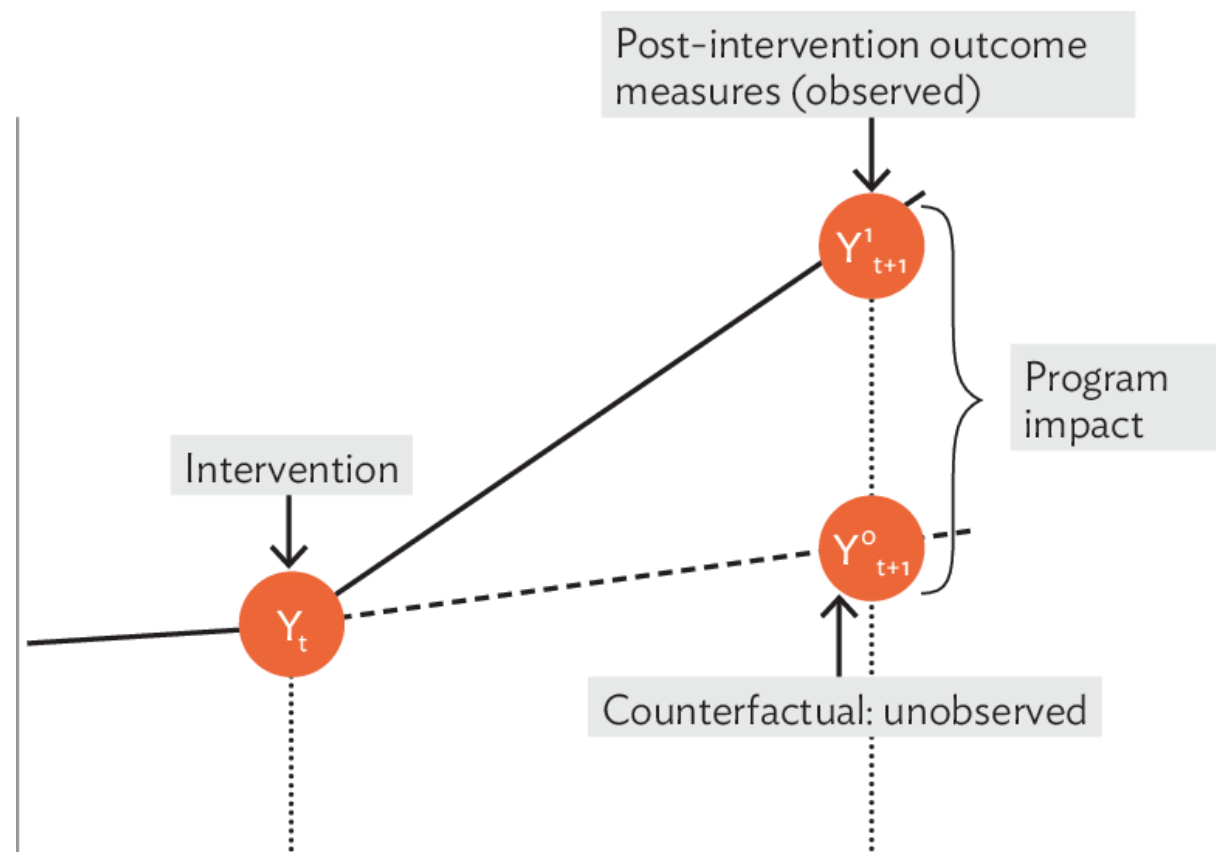


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What is impact evaluation?

- It involves assessing changes attributable to a particular intervention, both intended and, ideally, unintended.
- This involves a counterfactual analysis, i.e., a comparison between what actually happened and what would have happened in the absence of the intervention.
- Impact evaluations attempt to answer questions about cause and effect.



Why do impact evaluation?

- Impact evaluation can be used to improve or refocus an intervention (i.e., for formative purposes) or to decide whether to continue, discontinue, replicate, or evaluate an intervention (i.e., for summative purposes).
- The advantage of impact evaluation is that it can be used formatively even when an intervention is already underway. The processes of a program can thus be improved for the next participants based on the results of an impact evaluation.
- Most often, impact evaluation is used for summative purposes that can provide insights into both what works and what is needed to make the intervention work for different groups in different settings.



When to do impact evaluation? (1)

Impact evaluation should be conducted only when its purpose is clear and when it is likely to yield useful results.

Prioritizing interventions for impact evaluation should consider:

- the relevance of the evaluation to the organisational or development strategy;
- its potential usefulness;
- the commitment from senior managers or policy makers to using its findings;
- and/or its potential use for advocacy or accountability requirements.

The timing of an impact evaluation is also a factor to consider. If the evaluation is too late, the results are available too late to make decisions. If the results are available too early because the evaluation took place too early, they provide an inaccurate picture of the impact.



Impact evaluation categories

Impact evaluation designs can be divided into three categories:

1. **experimental,**
2. **quasi-experimental,**
3. **and non-experimental designs.**

The categories differ in terms of feasibility, cost, involvement during the planning or post-implementation phases of the intervention, and degree of selection bias.



Experimental impact evaluation

The treatment and comparison groups in experimental evaluations are randomly selected and isolated from both the intervention and any other measures that might affect the outcome of interest.

These evaluation designs are referred to as **randomized control trials (RCTs)**.



Quasi-experimental impact evaluation

Quasi-experimental approaches can remove bias arising from selection on observables and, where panel data are available, time invariant unobservables.

Quasi-experimental methods include:

- matching,
- differencing
- instrumental variables
- and the pipeline approach

they are usually carried out by multivariate regression analysis



Non-experimental impact evaluation

- Non-experimental impact evaluations are so-called because they do not involve a comparison group that does not have access to the intervention
- The method used in non-experimental evaluation is to compare intervention groups before and after implementation of the intervention.
- Non-experimental designs are the weakest evaluation design, because to show a causal relationship between intervention and outcomes convincingly, the evaluation must demonstrate that any likely alternate explanations for the outcomes are irrelevant.



Impact evaluation methods (1)

The evaluation purpose refers to the rationale for conducting an impact evaluation. Many impact evaluations use the standard OECD-DAC criteria (OECD-DAC accessed 2015):

- **Relevance:** The extent to which the objectives of an intervention are consistent with recipients' requirements, country needs, global priorities and partners' policies.
- **Effectiveness:** The extent to which the intervention's objectives were achieved, or are expected to be achieved, taking into account their relative importance.
- **Efficiency:** A measure of how economically resources/inputs (funds, expertise, time, equipment, etc.) are converted into results.
- **Impact:** Positive and negative primary and secondary long-term effects produced by the intervention, whether directly or indirectly, intended or unintended.



Impact evaluation methods (2)

The evaluation purpose refers to the rationale for conducting an impact evaluation. Many impact evaluations use the standard OECD-DAC criteria (OECD-DAC accessed 2015):

- **Sustainability:** The continuation of benefits from the intervention after major development assistance has ceased. Interventions must be both environmentally and financially sustainable. Where the emphasis is not on external assistance, sustainability can be defined as the ability of key stakeholders to sustain intervention benefits – after the cessation of donor funding – with efforts that use locally available resources.



Topic 2.3.4 Concluding remarks

- 2.3.1 Using evidence for ideation
- 2.3.2 Usability Evaluation & UX Research
- 2.3.3 Evaluation of Impact
- **2.3.4 Concluding remarks**



2.3.1
2.3.2
2.3.3
2.3.4

Questions that could be used for break out sessions

- How can the education sector build a better bridge between research and practice, so knowledge about what works where can be documented and spread?
- What criteria do educators use to select digital learning tools to include in their lessons?
- How can the lack of evidence for educational technology tools be explained?
- How would you proceed about proving that the educational technology tool you developed has value for educators?





Congratulations!
You have completed this module!

