

A close-up, low-angle shot of a 3D printer's nozzle printing a translucent, geometric part on a metal build plate. The scene is dimly lit with a strong green color cast. The printer's mechanical components are visible in the background and foreground, slightly out of focus.

# EcoFix 3D

Repair. Reuse. Renew.

# What is EcoFix 3D?

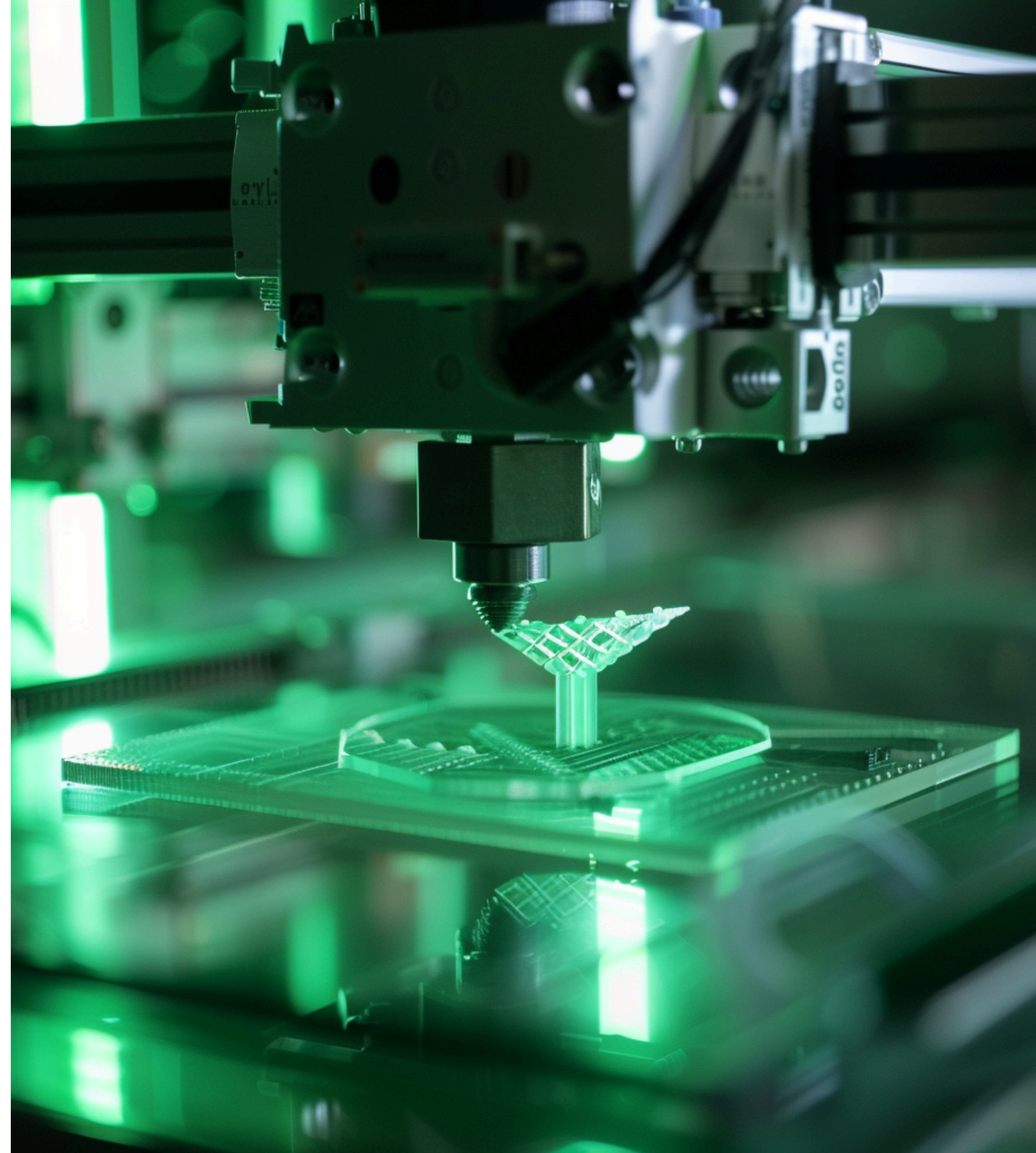
EcoFix 3D empowers users to repair broken items using advanced 3D scanning and AI design technology, reducing waste and promoting sustainability.

## Vision

To make sustainable repair solutions accessible to everyone.

## Mission

To reduce waste by empowering easy, innovative repairs.



# IMPACT GAPS CANVAS

## CHALLENGE MAPPING

### How do you describe the challenge?

**Description:** Many consumers discard broken items because repair options are either unavailable, too expensive, or too complex.  
**Effects:** This leads to increased waste, environmental harm, and unnecessary consumer expenses.  
**Related Issues:** The throwaway culture, resource depletion, and inadequate access to repair services.

### What is the impact of the challenge?

**Impacted Parties:** Consumers, especially in remote areas, environmentalists, and tech enthusiasts.  
**Research Insights:** Studies indicate that significant amounts of waste come from discarded items that could potentially be repaired.

### What is the cause of the challenge?

**Causes:** Lack of awareness, high repair costs, inconvenience, and technical complexity.  
**Beneficiaries of Status Quo:** Manufacturers of new products and waste management companies.

### What is the history and future of the challenge?

**Historical Evolution:** Increasing consumerism and technological advancements have exacerbated the problem of waste.  
**Future Projections:** Without intervention, the waste problem will worsen, but there is potential for significant impact if repair becomes more accessible.

## IMPACT GAPS

What is missing that could close the gap between the challenge and solutions, where are opportunities for collective impact, and what are the lessons learned?

### Where are the gaps between the challenge and solutions?

**Underserved Areas:** Rural communities, low-income households, and those without tech skills.  
**Missing Elements:** Educational initiatives on repair, accessible 3D printing services, and affordable repair kits.

### Where are the gaps within the solutions?

**Missing:** Comprehensive regulatory support, community-level repair hubs, and partnerships with educational institutions.  
**Actions to Fill Gaps:** Develop community workshops, subsidize 3D printers, and launch educational campaigns.

### Where are the unaddressed obstacles?

**Overlooked:** The digital divide and resistance to adopting new technologies.  
**Negative Consequences:** Continued waste and environmental harm if these are not addressed.

### What are the key lessons learned?

**Lessons:** Education and support are crucial, and partnerships can enhance reach and impact.  
**Opportunities:** Affordable repair kits, policy advocacy, and community engagement.

## SOLUTIONS MAPPING

What models are already being tried, what's working, what's not, and what resources are available?

### What is happening locally in Toronto?

**Maker Spaces:** Toronto Tool Library, Makerwiz.  
**Community Workshops:** Toronto Repair Cafe.  
**Government Programs:** Ontario's Blue Box Program, Waste-Free Ontario Act.  
**Repair Cafes:** Volunteer-driven repair events.  
**Educational Initiatives:** DIY repair workshops.  
**Models:** Non-profit workshops, for-profit repair services.

### What is happening globally?

**Europe:** Right to Repair legislation.  
**USA:** iFixit guides and tools.  
**Lessons:** Advocate for repair-friendly regulations and design.

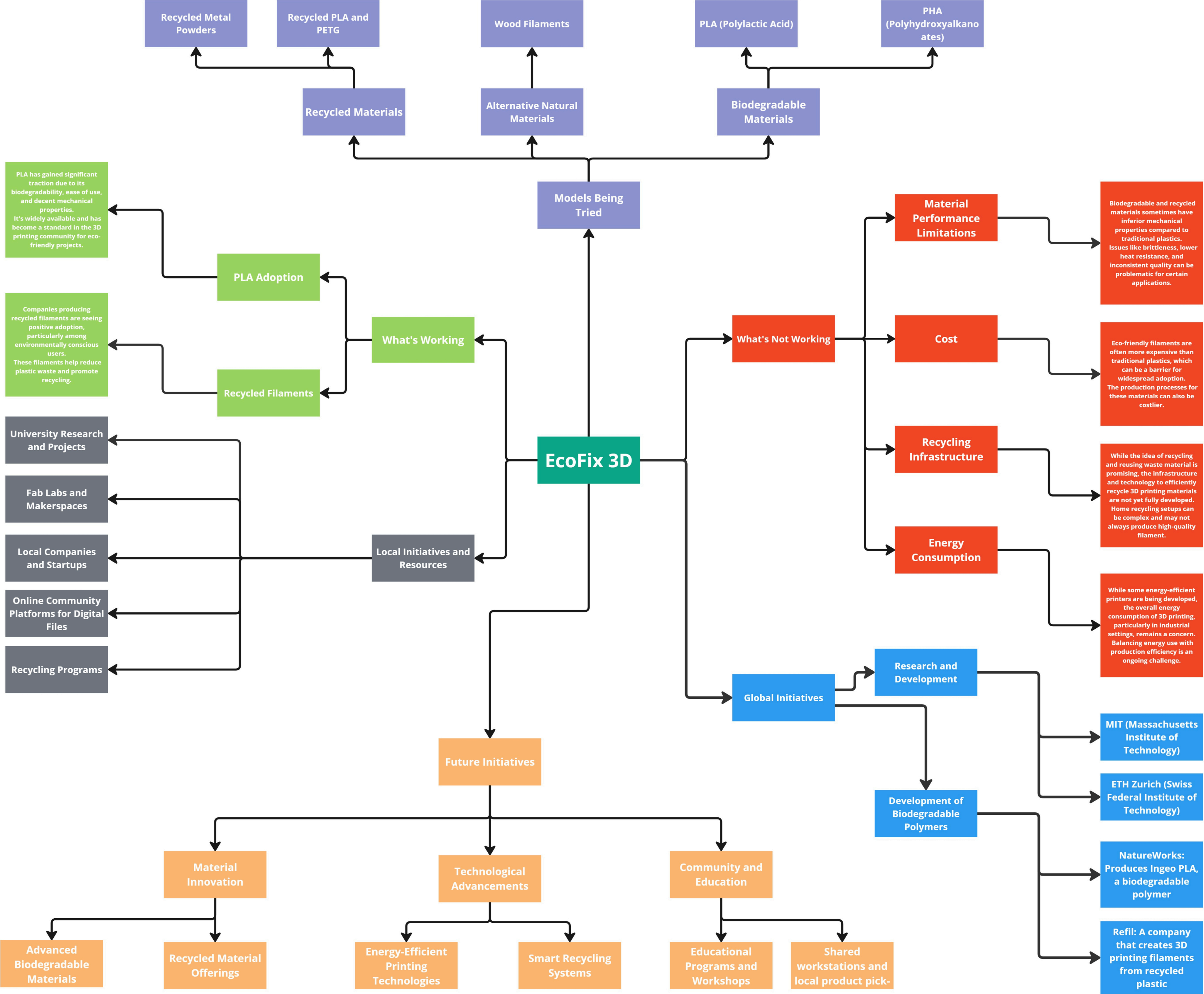
### What's working, and what's not?

**Successes:** Community engagement, repair cafes.  
**Failures:** High costs, limited access to tech.  
**Attribution:** Success from community support, failure due to financial/technical barriers

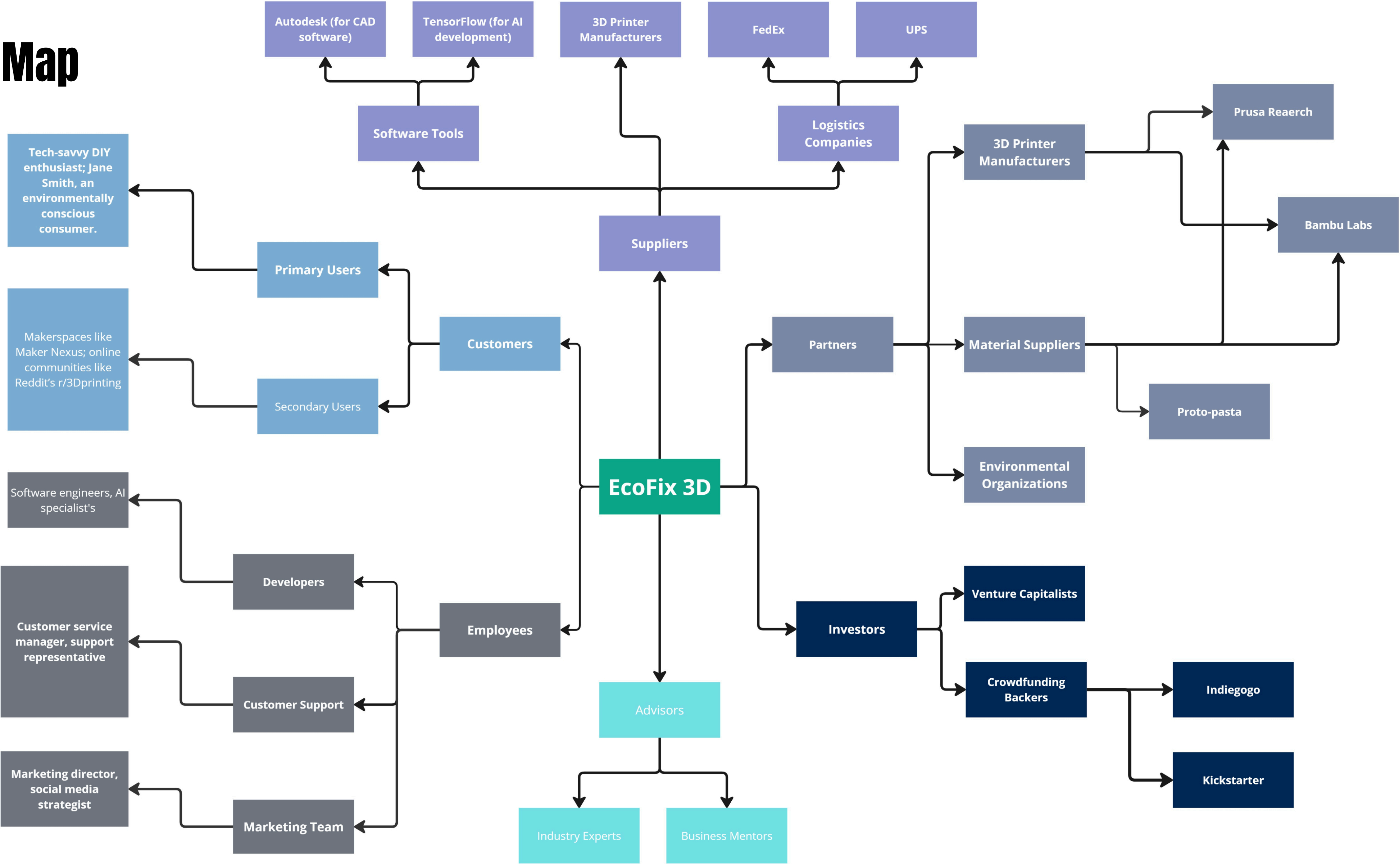
### Where is the focus and the future?

**Current Focus:** Accessible repair tools and education.  
**Ignored Areas:** Remote and low-income communities.  
**Future Scenarios:** Affordable 3D printers, cultural shift towards sustainability.

# Solutions Map



# Stakeholder Map



# Interview

## Emily Clark

Sustainability Coordinator at IKEA Canada

### Relationship

Former colleague from a previous internship, now a professional contact.

### Background

Emily has been working at IKEA for 5 years, focusing on sustainable practices and circular economy initiatives. She is involved in projects that promote repair and reuse of IKEA products.

### Interview Setup

Location: Online via Zoom  
Date: July 15th, 2024  
Duration: 30 minutes

### Key Topics

- Sustainability
- Product Design
- Circular Design
- Industrial Design
- Waste Reduction



# Notable Questions & Answers

## Interview with Emily Clark

**Mackenzie:** What challenges do you see in promoting repairs among consumers?

**Emily:** The biggest challenges are changing consumer habits and making repair processes easy and accessible. Many customers find it **easier to replace items rather than repair them**.

**Joshua:** How does IKEA support customers in the repair process?

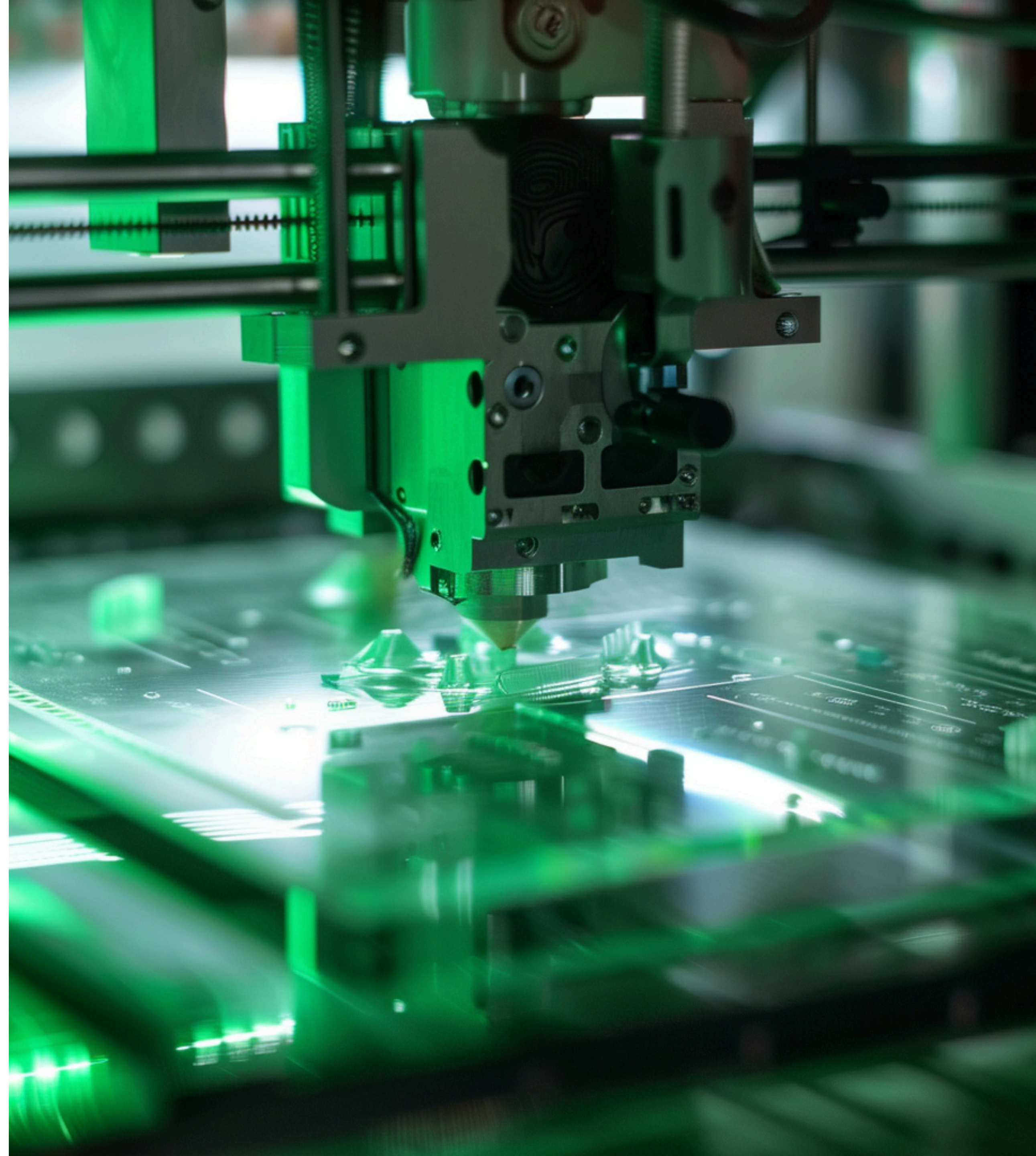
**Emily:** We provide **online resources**, such as **step-by-step repair guides** and videos. We also offer **spare parts** for our products and **run in-store workshops** on basic repair skills.

**Joshua:** What role do you think technology, like 3D scanning and AI, can play in enhancing repair initiatives?

**Emily:** Technology can make **repairs more accessible** by simplifying the identification and creation of replacement parts. AI can help in designing these parts accurately and efficiently, while 3D scanning can assist in replicating complex components.

**Mackenzie:** How important is sustainability in IKEA's overall strategy?

**Emily:** Sustainability is a core part of IKEA's strategy. We are committed to becoming a **circular** and climate-positive business by 2030. **Encouraging repairs and reuse** is a significant part of this commitment.



# Interview

## Siddh Bathla

Student Monitor at Ex Fab

### Relationship

Former classmate.

### Background

4th-year Industrial Design student at OCADU, Student Monitor at XFab.  
Interested in 3D printing and circular design.

### Interview Setup

Location: OCAD U, 5th floor  
Date: July 18, 2024  
Duration: 20 minutes

### Key Topics

- Interactive Design
- Repair Technology
- Industrial Design
- Educational Resources



# Notable Questions & Answers

## Interview with Siddh Bathla

**Joshua:** Can you describe your role at XFab and how it relates to design and repair?

**Siddh:** At XFab, I assist students with 3D printing, laser cutting, and other fabrication technologies. I help troubleshoot issues and ensure equipment is properly maintained, which gives me practical experience in design and repair.

**Mackenzie:** What challenges do you see in making repair technologies more user-friendly?

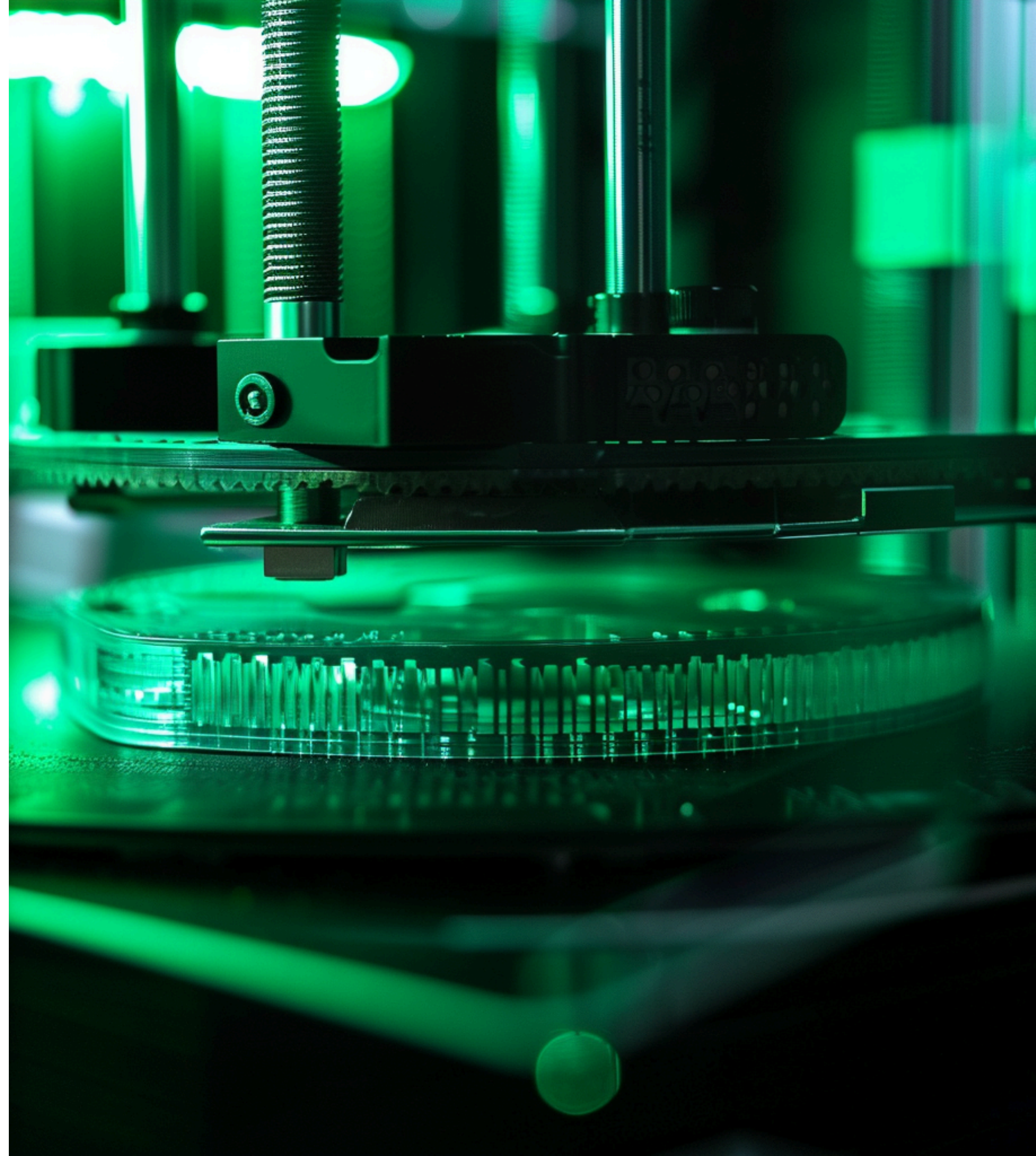
**Siddh:** The biggest challenges are the learning curve and accessibility of the technology. Many users find design software complex and are intimidated by technical jargon.

**Joshua:** How can industrial design principles enhance the user experience for repair tools?

**Siddh:** By focusing on intuitive design, we can make tools more user-friendly. This includes simplifying interfaces, providing clear instructions, and incorporating visual aids.

**Mackenzie:** What role do you think sustainability plays in design education and practice?

**Siddh:** Sustainability is a growing focus in design education. We are taught to consider the life cycle of products and how design choices impact the environment. Repair and reuse are key components of this approach.



# Interview

## Sarah Williams

Graphic Designer and Hobbyist Maker

### Relationship

Community member on local forum for 3D printing.

### Background

Sarah owns a 3D printer at home and uses it for personal projects, repairs, and creative endeavors. She has experience with designing and printing custom parts for various household items.

### Interview Setup

Location: Online via Zoom  
Date: July 19, 2024  
Duration: 25 minutes

### Key Topics

- Personal Projects
- CAD Modeling
- DIY Fixing
- Business Opportunities



# Notable Questions & Answers

## Interview with Sarah Williams

**Mackenzie:** Can you tell me about your experience with using a 3D printer at home?

**Sarah:** I've been using a 3D printer for about three years now. I started with small projects like keychains and gradually moved to more complex items. It's been a fantastic tool for both creative projects and practical repairs.

**Mackenzie:** What kind of items have you repaired using your 3D printer?

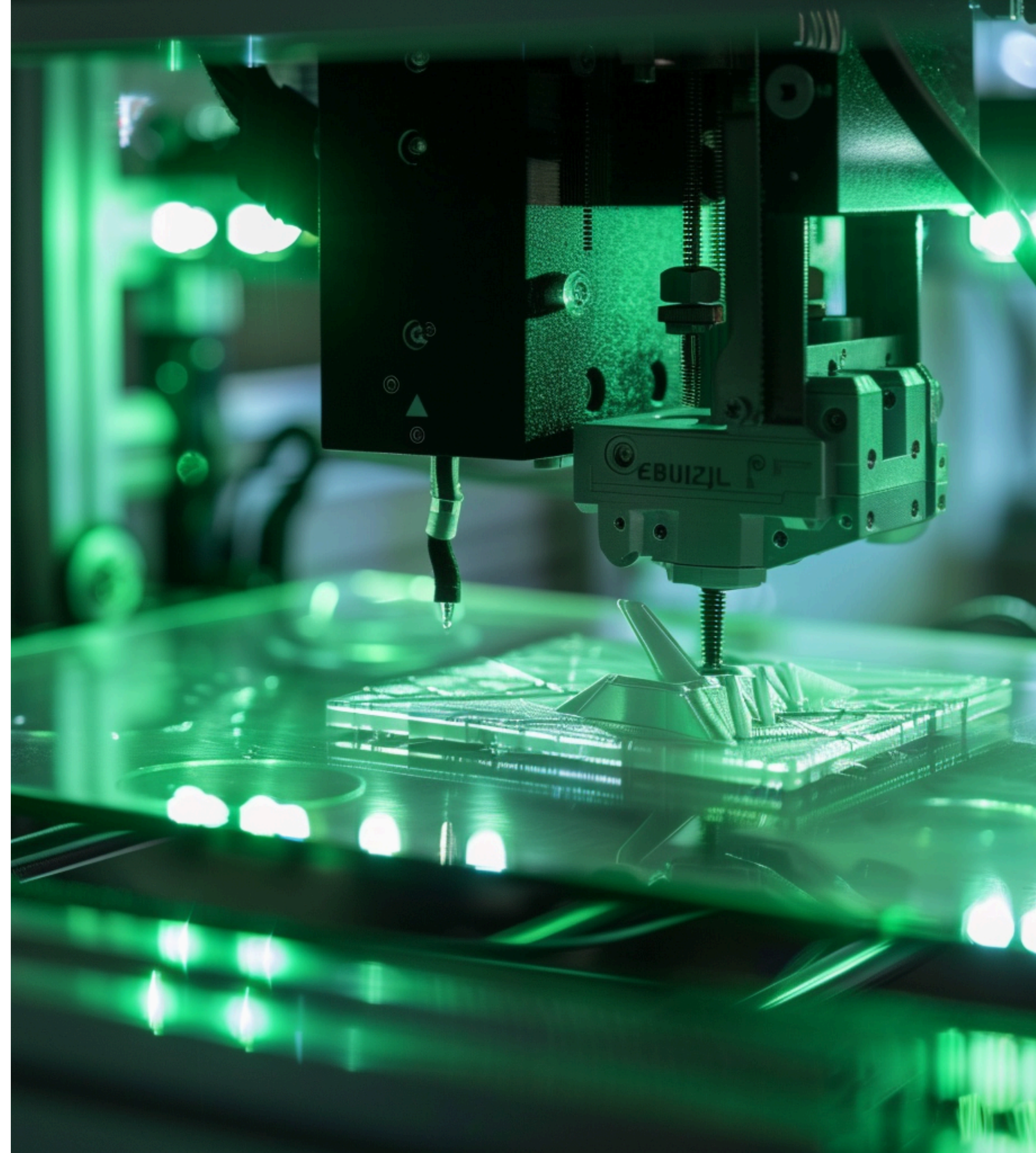
**Sarah:** I've repaired quite a few things, from a broken kitchen blender part to a missing piece from my vacuum cleaner. It's incredibly satisfying to fix something yourself instead of buying a new one.

**Joshua:** What challenges do you face when trying to repair items with your 3D printer?

**Sarah:** One of the biggest challenges is designing the replacement parts. It requires a good understanding of CAD software, which can be quite complex. Additionally, getting the dimensions right and ensuring the part fits perfectly can be tricky.

**Mackenzie:** How do you think EcoFix 3D can address these challenges?

**Sarah:** An app that simplifies the design process would be a game-changer. If EcoFix 3D can provide an easy-to-use 3D scanning and AI design tool, it would make repairs much more accessible to people who aren't tech-savvy. It would save a lot of time and effort in creating accurate replacement parts.



# Interview

## Michael Turner

Mechanical Engineer and MakerSpace Enthusiast

### Relationship

Former colleague at an internship.

### Background

Michael has a deep interest in DIY projects and regularly uses 3D printing to create and repair items at his local MakerSpace. He has extensive experience in mechanical design and prototyping.

### Interview Setup

Location: Online via Zoom  
Date: July 20, 2024  
Duration: 15 minutes

### Key Topics

- Custom 3D Parts
- Innovation
- AI Design Tools
- Sustainability



# Notable Questions & Answers

## Interview with Michael Turner

**Joshua:** Can you tell me about your experience using 3D printing for repairs at your MakerSpace?

**Michael:** I've been using 3D printing for about five years, primarily for creating prototypes and repairing mechanical parts. The ability to design and print custom parts has been incredibly useful.

**Joshua:** What types of items have you repaired using 3D printing?

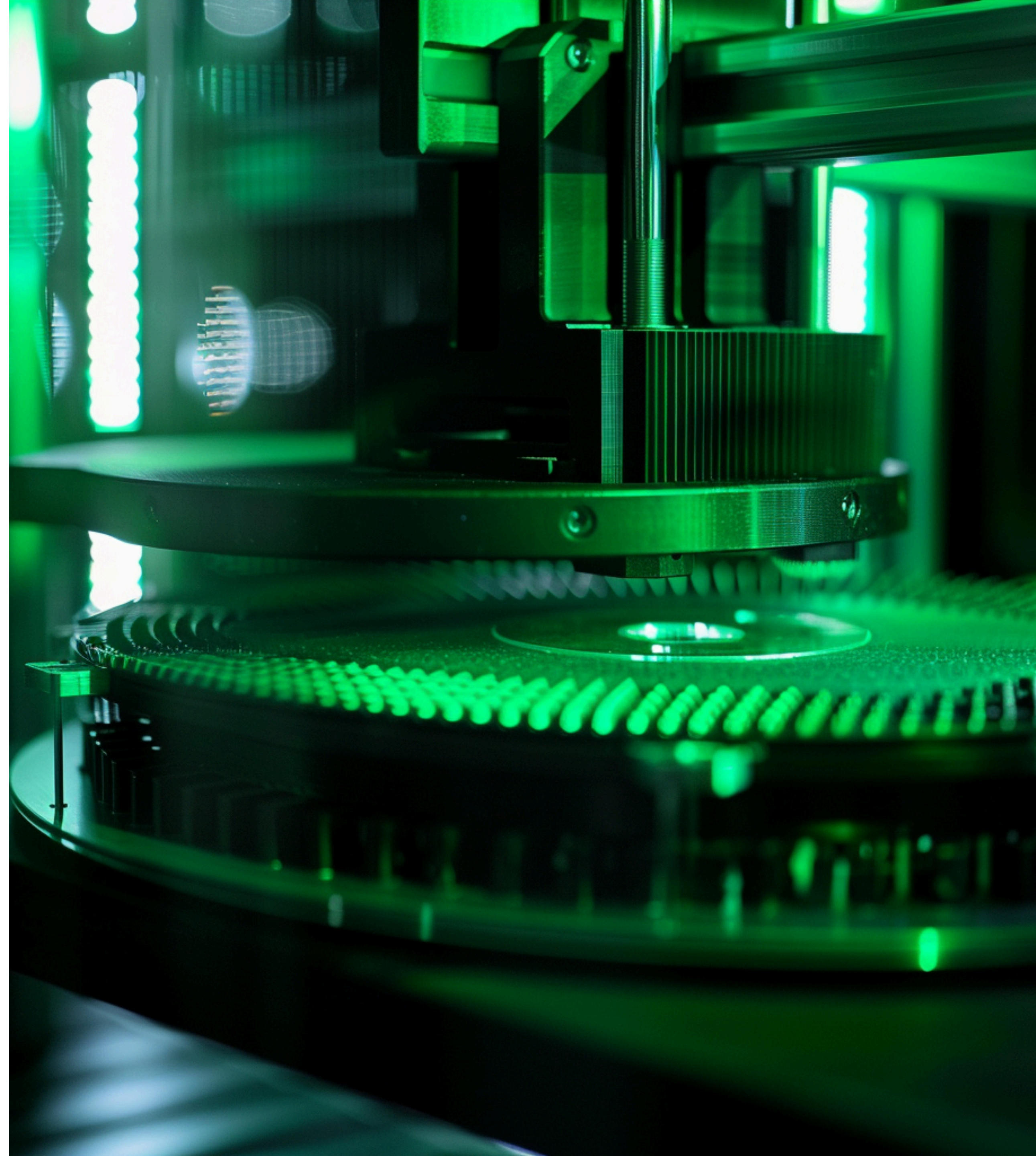
**Michael:** I've repaired a variety of items, including a broken gear in a coffee grinder, a missing knob on a washing machine, and several custom brackets and mounts for my workshop tools.

**Mackenzie:** What challenges do you face when repairing items with 3D printing?

**Michael:** The main challenges are accurately designing the parts and ensuring they fit properly. Sometimes, it takes multiple iterations to get the dimensions and functionality right.

**Joshua:** How do you think EcoFix 3D can address these challenges?

**Michael:** An app that combines 3D scanning with AI design tools would be very helpful. It would streamline the process of creating accurate models and save a lot of trial and error.



# Enhancing EcoFix 3D

## Optimizing Through Interview Insights

Combining insights from all interviews, EcoFix 3D can enhance its app by **integrating user-friendly design** principles and accurate 3D scanning with AI for precise repair models. The app should offer step-by-step guides and tutorials to **address varying technical skills**, and provide **customizable repair options** with eco-friendly materials. Educational initiatives like workshops can improve user skills, while **fostering an online community** will enhance collaboration. Personalized support and continuous improvement based on feedback will refine the app. Advocating for **sustainability** and **repair education** will strengthen EcoFix 3D's mission.

