THE NECESSARY CREATION OF "PRE-ENTREPRENEURS" IN INDIA:

The Experiment of Early Maker Training in Schools to Develop Future Entrepreneurs

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Research Goal

Study the impact of **maker training** intervention on middle and high school students on their academic performance, innovation skills, entrepreneurship attitudes and social engagement. Create an evidence-based model for large scale implementation of such a program in Asian countries.

Background

The Government of India is targeting a 10% yoy GDP growth to generate 175M jobs and eradicate extreme poverty by 2032[2]. Doing this means creating **1 million** jobs in India **PER MONTH**.

Youth entrepreneurship is seen as a key contributing factor to this ambitious goal.

GOI envisions its youth to be ENTREPRENEURS.

Atal Tinkering Labs created in 2017 in schools

ATLs in plan for the next FOUR years

To harness the full potential of India's 700M population below 30, the research investigates **NITI Aayog** and **Atal Innovation Mission**'s 2,441 **Atal Tinkering Labs** (ATL) in 2017 to understand the impact on the life of about students in middle and high schools.

Research

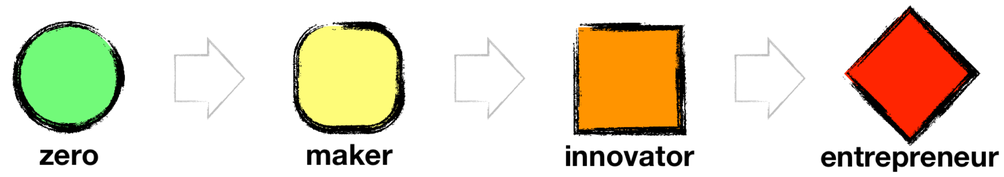
The hypothesis, "**Early introduction to maker skills and social skills in a student's life will have a positive impact on the student in her academics, innovation skills, entrepreneurship attitudes, and social engagement**" is being studied here through a randomized controlled test. The study consists of introducing making and social skills to students in several middle and high schools from rural and urban regions across India and studying changes in attitudes, self-efficacy, and development over eight years.

Field Researchers (Mentors) consisting of recent college graduates from rural and urban regions, are trained in making skills, social skills, and data collection.

Field Researchers return to their region and take responsibility for 20 schools. They will conduct maker programs and mentor teachers and students.

Field Researchers conduct surveys of selected students, parents, teachers, and school administrators. More students are trained to do survey online.

Framework



zero	maker	innovator	entrepreneur
uninitiated	hacks **things**	hacks **problems**	hacks **opportunities**
Students from most schools are primarily **job seekers**, following subject syllabus and grades, who have not been exposed to practical application of their learning.	Learns to **imagine, design and create** things. Use Digital design and fabrication tools to speed up the cycle of practice and learning.	Identifies unmet human needs in communities through practice of **Design Thinking**. Evaluates opportunities for **social impact and financial gain**.	Creates **viable and accessible solutions** for problems that people want solved. Define and evaluate the need and **strategize** how to **reach** the solution to customer profitably.

Intervention Process

Maker Skills

Focused on building the ability to imagine, design, and make physical products. The Maker training covers the following topics through hands-on exercises:

- Ideation
- Product Concept design
- Physical design
- Control design
- Logic design
- Fab Tools
- Fabrication

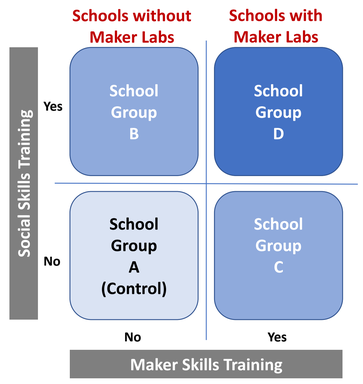
Social Skills

Intervention designed to build interpersonal interactions, communications, and conflict resolution. The Social skills training include:

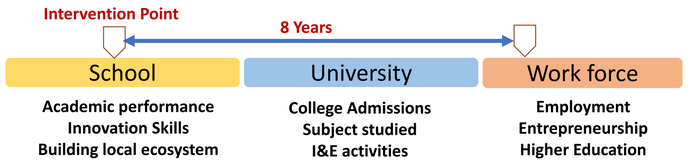
- Presentation
- Negotiation
- Public speaking
- Interviewing

Intervention Matrix

The study involves four groups of schools with different interventions. Students from schools across India with and without maker labs will participate in this study over eight years.

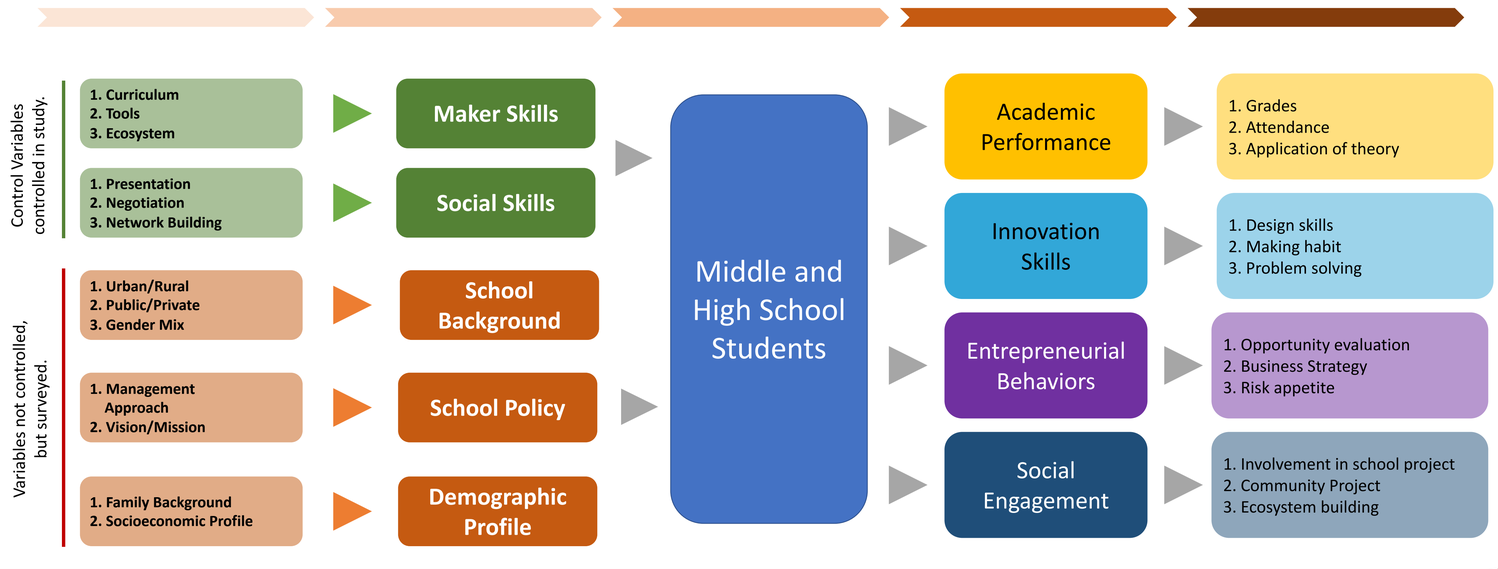


Period of Study



School	University	Work force
Academic performance **Innovation Skills** **Building local ecosystem**	**College Admissions** **Subject studied** **I&E activities**	**Employment** **Entrepreneurship** **Higher Education**

Impact Model



Outcome

Validation of Model

This study aspires to achieve the following:

1. **Validate the impact of maker and social skills on students**
2. **Study impact of background of the student, such as, region, urban/rural, culture, language, on the outcome**
3. **Impact of number of makers in creation of local making and entrepreneurship ecosystem**

We are looking for ideas and collaborations.
Please contact rajnair@mit.edu

Scaling of Model

Opportunity to impact communities in Asian countries using this intervention:

1. **Create an optimized model for content and delivery**
2. **Help nations scale the process to create impact in the next generation**

1. "From poverty to empowerment: India's imperative for jobs, growth, and effective basic services" – McKinsey Global Report
2. "India to become $10 trillion economy by 2032: Amitabh Kant, CEO, NITI Aayog", Economic Times,, Apr 22 2016

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