Tinkering Laboratory@IITK

by
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in association with
SnT Council
Student Gymkhana
IIT Kanpur

What is Tinkering?

→ Informal: A mischievous child: … *little tinkers, we were*

→ Attempt to repair/improve something in a **casual** way

An idea that is developed and put into action is more important than an idea that exists only as an idea
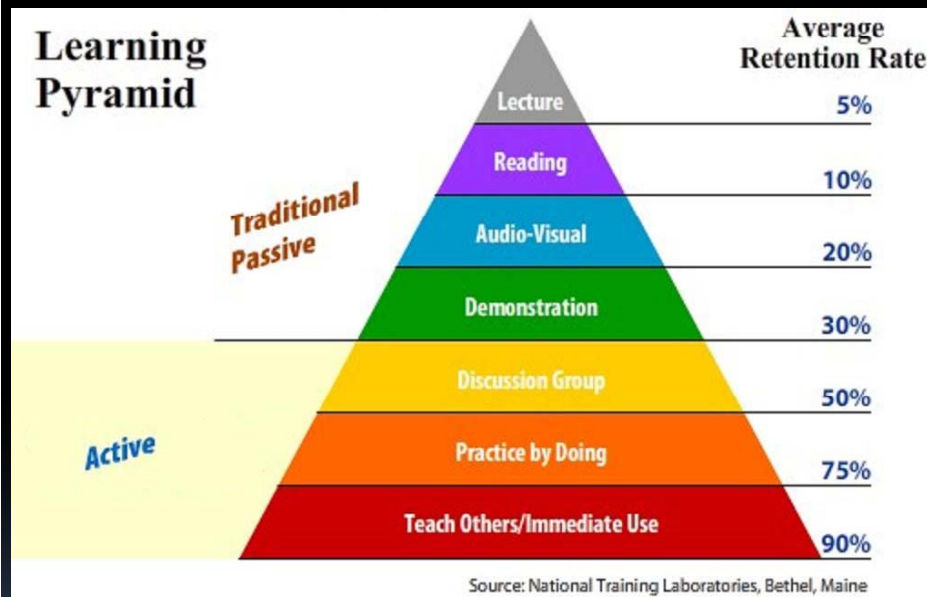
Need Statement

- No laboratory existed in the institute wherein students can go and 'make' something on their own, in there free time!

- All labs were either with an academic goal or were research oriented.

- Trying out, working with hands, and creating effective engineering designs and concepts must be an integral part of engineering education.

- The Tinkering laboratory was started in 2012, attached to the Central Workshop, and works in tandem with the 4-i lab.

- The lab has been funded by the generous contributions of alumni of '76 and '86 batch and DST (via the Multi-disciplinary Innovation Laboratory Initiative).

- It is operated/run by the Student Gymkhana. The idea is that students 'operate' on their own, under supervision.

When you don't tinker?
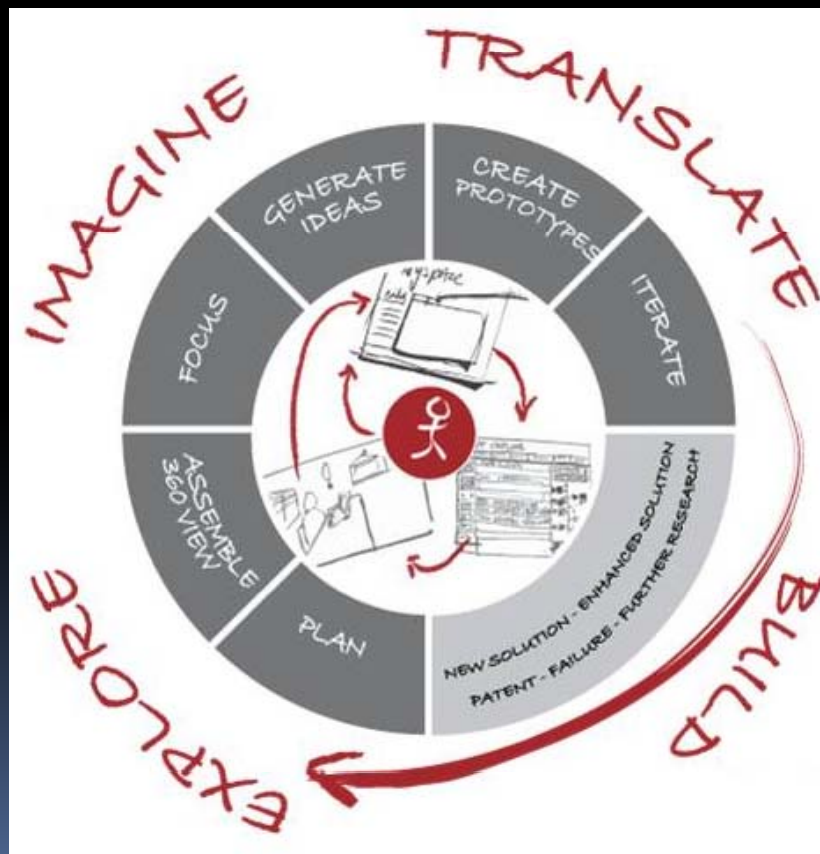
All work and no play makes
Pappu a dull boy

Learning Pyramid

	Average Retention Rate
Lecture	5%
Reading	10%
Audio-Visual	20%
Demonstration	30%
Discussion Group	50%
Practice by Doing	75%
Teach Others/Immediate Use	90%

Traditional Passive

Active

Source: National Training Laboratories, Bethel, Maine

All theory and no activity makes
Pappu a terrible engineer

The Innovation Cycle

**What role does tinkering play
in an innovation eco-system?**

Creative engineers must eventually
come out of their

`Think Space' to hands-on `Tinker Space'

Transform their ideas into
real-life engineering objects

and…..eventually to go beyond to

Products , Services and Patents/IP

Laboratory features

- It is a platform for all institute students, incubating companies, entrepreneurs, to involve in hands-on activity in mechanical/electrical/electronics elements fabrication processes.

- The lab remains open from 14:00 hrs to 22:00 hrs on Tuesday through Friday and 09:00 hrs to 17:00 hrs on Saturdays.

- The lab infrastructure has been funded by the generous contributions of alumni of '76 and '86 batch and DST (via the **Multi-disciplinary Innovation Laboratory Initiative**).

- It is operated/run by the Student Gymkhana, SnT Council.

- Full time technical staff (03) and project staff (02), for helping students.

- The primary idea is that students 'operate' on their own, under staff supervision .

Facilities

- Basic lathe machines
- Basic milling machines
- Bench drilling machine
- Vacuum plastic forming machine
- Sheet metal cutting and bending machine
- Shearing machine, small grinders, buffing tools,
- Hand grinders and drill machines
- Bench vices for metal fitting and wood work activities
- Spray painting, all fitting and carpentry tools
- Marking and measurement tools
- Air-compressors
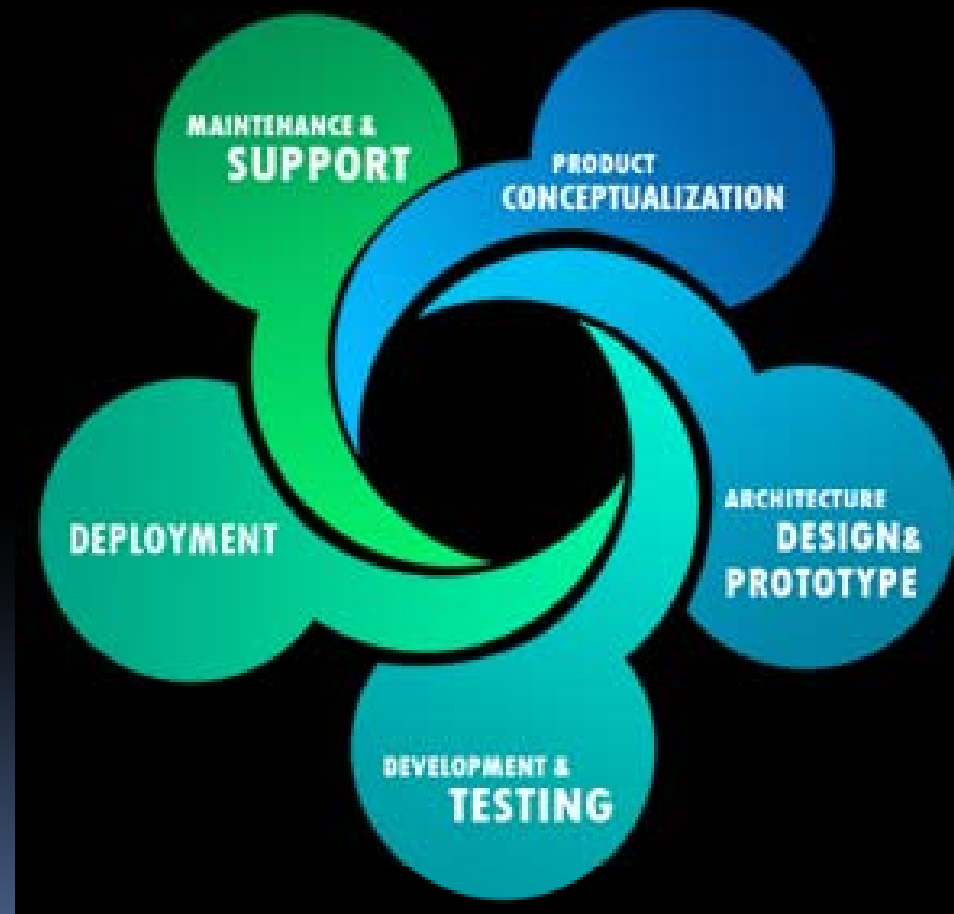- Welding machine
- 3-D scanner

Accessibility

The lab is accessible to

- All students of the institute
  (via registration with SnT Council)

- Incubators from IITK

- Start-up entrepreneurs

For the purpose of:

➢ Tinkering !!

➢ Testing models

➢ Validation of concepts

➢ Prototyping their ideas into
  new products and services

Running expenses

Annual consumable expenses of the order of Rs. 5.0 lacs are available through DRPG funding (dedicated project)

All required raw material such as:

- Plexi glass, plastic, wood, aluminum structural elements Fasteners, nuts, bolts, washers and etc.
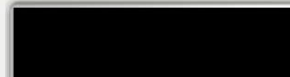- Consumable tools
- Paints

Main users so far…

Robocon

Robocon, as some might be knowing, is the most

SAE IITK

Society of Automotive Engineers, IIT Kanpur, a

Aeromodelling club

Aeromodelling is the art of designing, building and flying miniaturized aircrafts (powered or non-powered). While Aeromodelling has reached a certain degree of sophistication, one can build a model plane from any material which may include Paper, Balsa, Composites so on and so forth. It is both a hobby and sport; the hobby aspect involves ft, and the

RoboClub

The Robotics Club of IIT Kanpur is a fraternity, not

Electronics Club

The Electronics Club aims to teach and help people understand the seemingly incomprehensible electronic gadgets in the world today, and also assists people in developing their own devices. A Fifa game controller, POV display, Ethernet chat client, a touch sensor - these are only a few examples of projects that have been developed in the club in the recent past.

Some flagship projects

- Several student projects, national and international project competitions have been accomplished in the laboratory

- Few **patents** have also been filed now.

Amphitricycle

PVC Four-Wheel cycle

Amla Seed Remover

Assisted major projects

All Terrain Vehicle

BAJA student India 2015

SAE/Formula Racing events.

Nano-fibre deposition Machine

ROBOCON
a major festival for robotics enthusiasts

Student AUV (SAVe)
National Student Competition
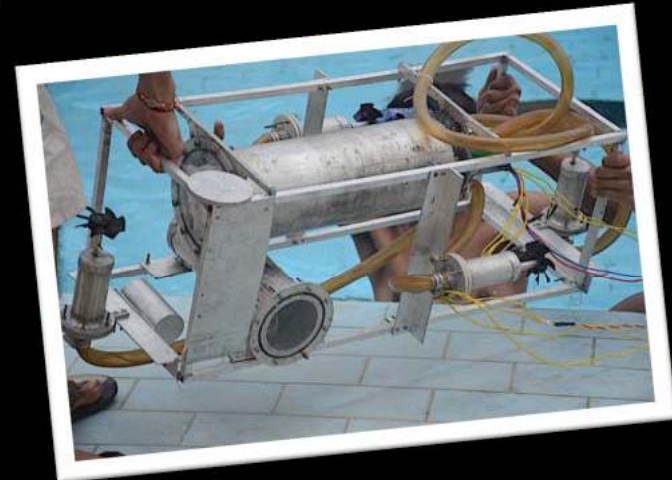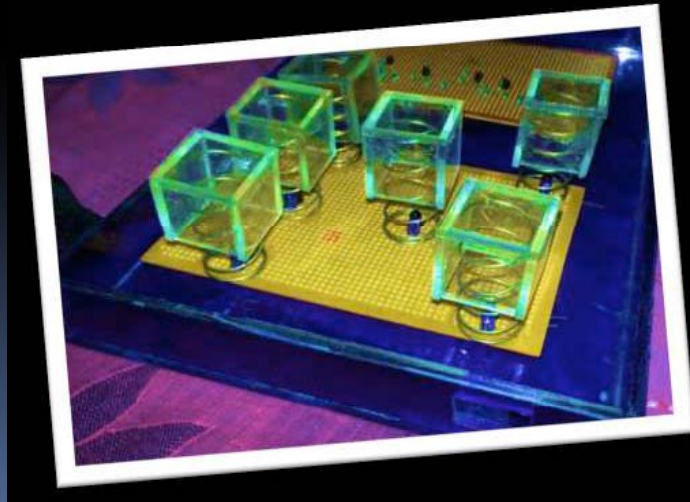
Assisted club projects

Chess Playing Robot

Hull Design for AUV

Analog Keyboard

Other projects

Pedal-Driven Multi-Tool
Carpenter Bench
(won 1st place at IMP, IITK)

Mechanical Amla Pricking Machine
(RuTAG)

Do visit the Tinkering Lab and explore yourself

Seeing is believing

Doing is achieving

The journey is worth exploring

Thank you