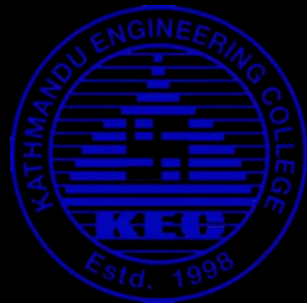
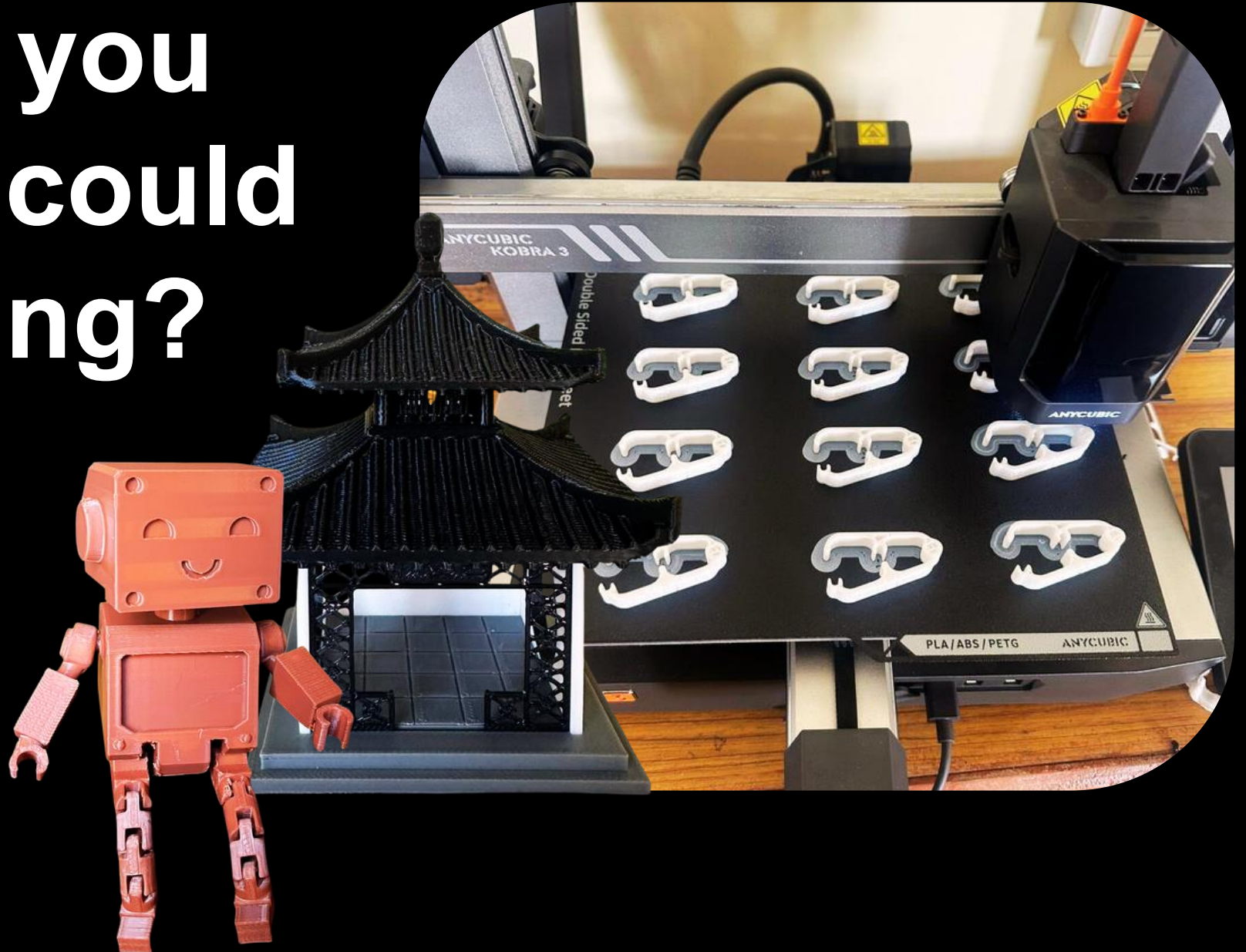


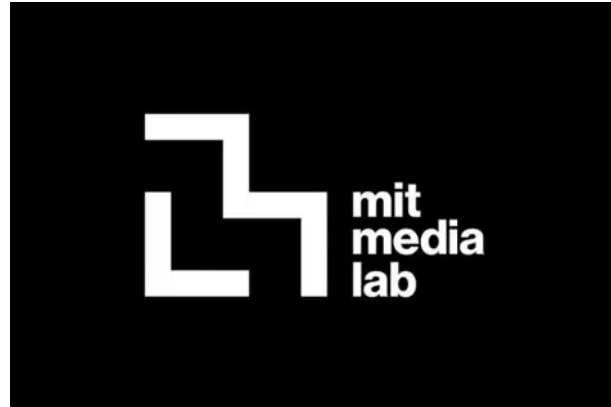
Apekshya Koirala
KEC Makerspace Coordinator



**What would you
make if you could
make anything?**



The Maker Movement



Neil Gershenfeld (MIT FAB Lab) began teaching a new course in 2001:

**How To Make
(almost) Anything**



Make: magazine in 2005 published articles on maker-related projects

Maker Faires – series of venues for makers to express themselves

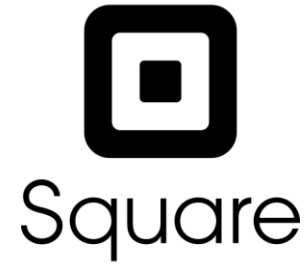
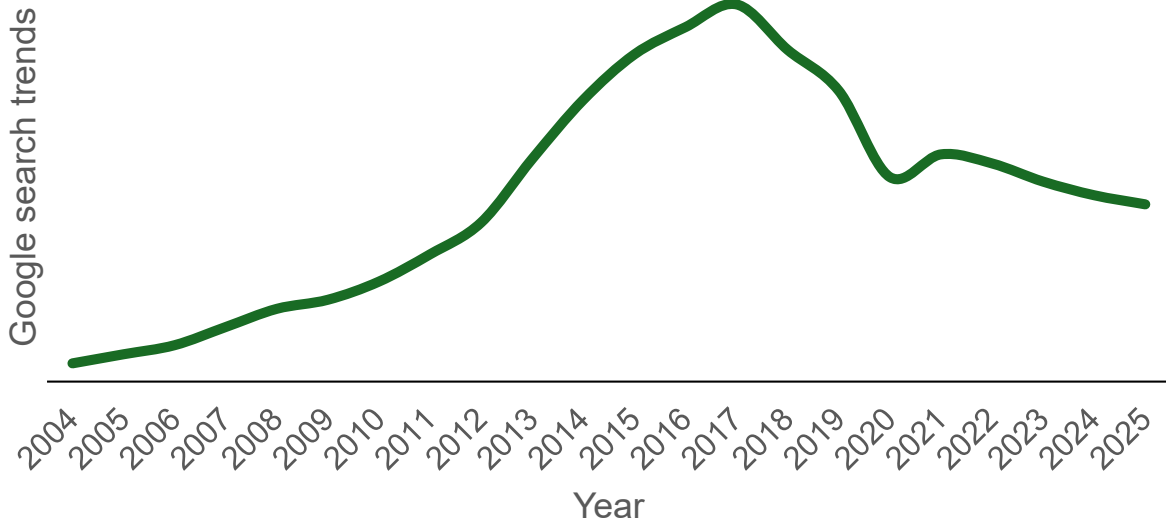


In 2026, there are over 2000 makerspaces, 1500 fab labs, and more than 2000 hackerspaces

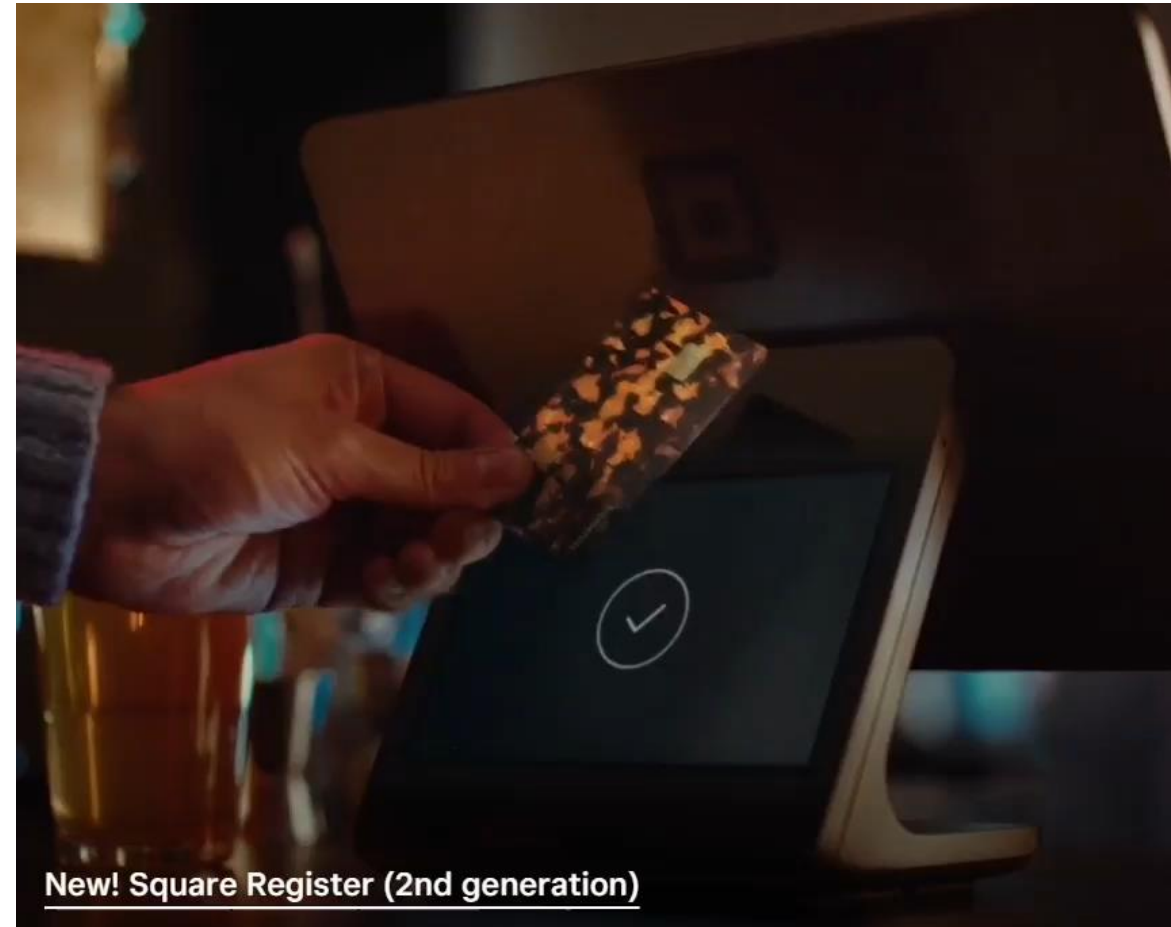
See full directory in makerspaces.com

What is a Makerspace?

Makerspaces are a shared, hands-on environment equipped with **fabrication tools**, collaborative **work areas**, and **technical support** that enables people to **design, prototype, and test ideas**



Square is a mobile payment company that enables card payments via smartphones created its **initial prototype** at the **TechShop makerspace**.



New! Square Register (2nd generation)

Designing the engineer of the future...

Education and Information Technologies (2022) 27:3467–3493
<https://doi.org/10.1007/s10639-021-10761-3>

Higher education and technical

Industry and Higher Education
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Exploring a construct model for university makerspace beyond curriculum

Qinglong Zhan¹ · Xiang

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Making Maker Literacies: Integrating Academic Library Makerspaces into the Undergraduate Curriculum

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Globally engineering programs have increasingly integrated design early in the curriculum through the introduction of makerspaces



Article

Makerspaces in First-Year Engineering Education

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The Inve
and Culture

CRAIG R. FOREST

University of Texas, Austin

biography



iMakerSpace Best Practices for Shaping the 21st Century Workforce

Impact of makerspaces in engineering education

Survey of students who took part in a 4-month makerspace project at University of Texas, Austin

Table 2: Matched t-test results and effect size for each factor

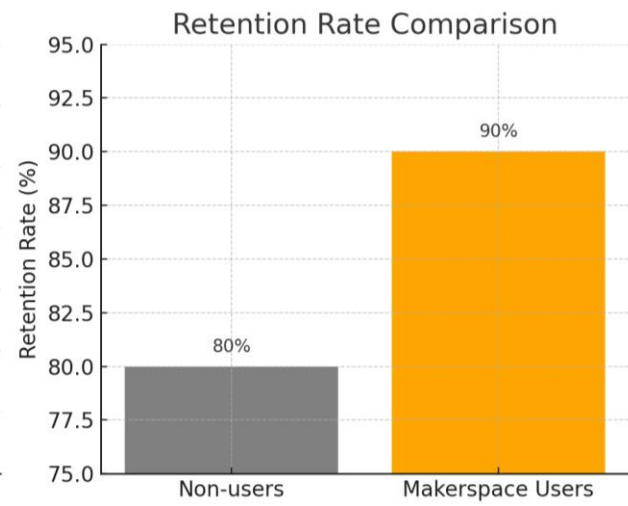
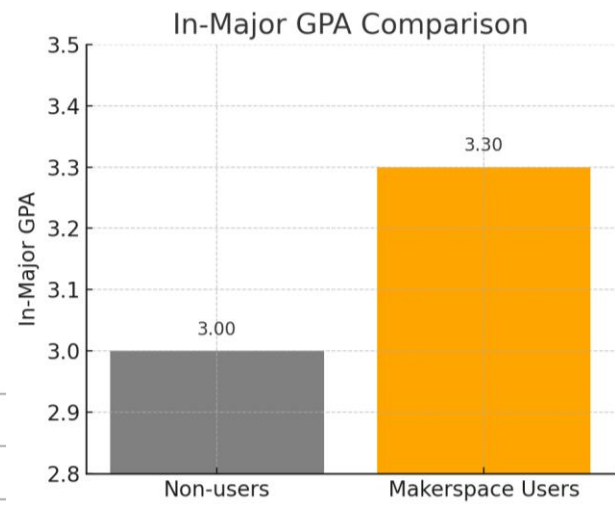
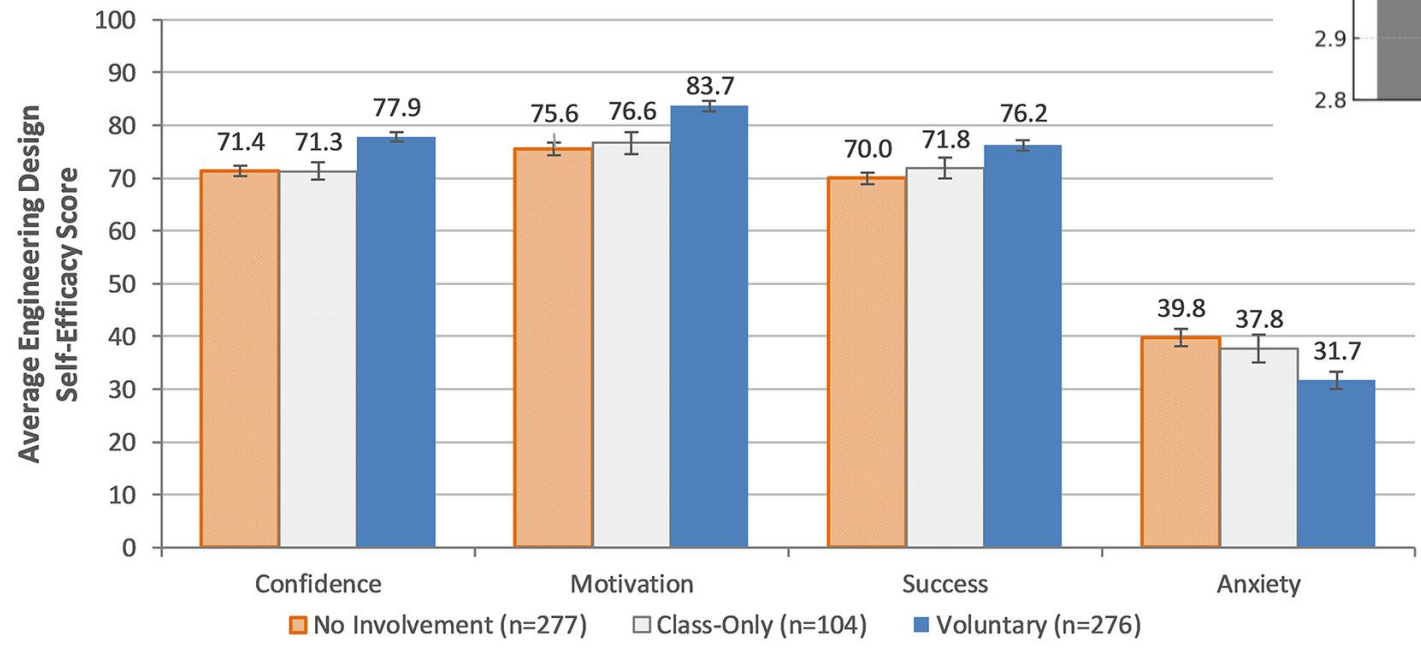
Factor	α	Scale Range	Pre	Post	P-Value	Effect Size
Technology Self-Efficacy	0.87	0-10	6.07	7.39	0.000	0.73
Innovation Orientation	0.83	1-5	3.34	3.69	0.000	0.46
Affect Towards Design	0.85	1-5	4.21	4.39	0.006	0.28
Design Self-Efficacy	0.82	1-5	3.31	4.02	0.000	0.81
Innovation Self-Efficacy	0.77	1-5	3.63	3.94	0.005	0.38
Belonging to Makerspace	0.96	0-10	4.53	6.05	0.000	0.53

Carbonell, R.M., et al. Innovation, Design, and Self-Efficacy: The Impact of Makerspaces. Presented at the 2019 ASEE Annual Conference & Exposition June 15 (2019)

“Technology self-efficacy, innovation orientation, affect towards design, design self-efficacy, and belonging to the makerspace were all positively and significantly impacted within individuals who completed projects in the makerspace”

Backed by research globally

- Students involved in Makerspace show higher in-major GPA
- Early makerspace involvement is linked to higher retention in engineering majors



Note: Values are illustrative based on reported significant differences. Sources: International Journal of Engineering Education; NSF Makerspace Studies

Beyond grades, makerspace projects directly boost how students feel about their ability to design, innovate, and belong in engineering

Hilton, E.C., et al., Report on Engineering Design Self-Efficacy and Demographics of Makerspace Participants Across Three Universities. J. Mech. Des. 142, (2020). <https://doi.org/10.1115/1.4046649>

Identifying gaps in KEC's engineering program

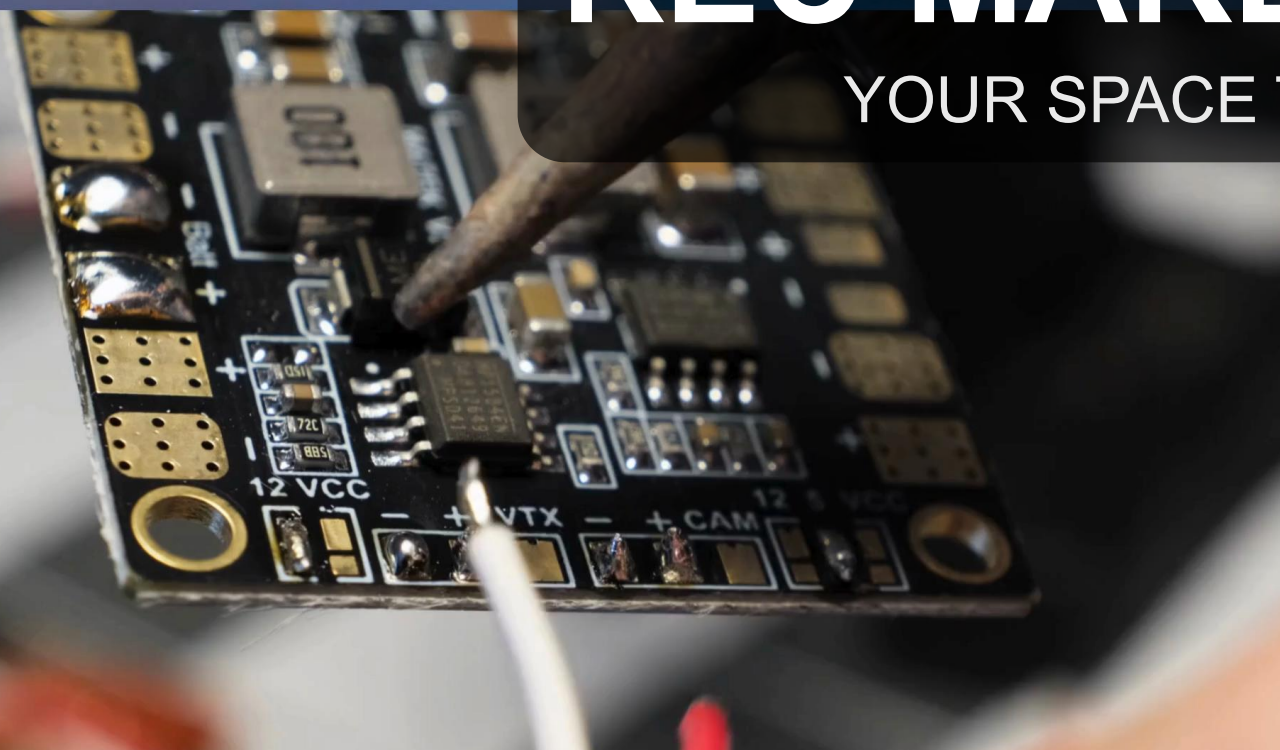


- Lack of community spaces where students can collaborate
- Need for hands-on prototyping tools for club activities and class projects
- Lengthy process to access equipment – forms, forms and more forms!
- Misconception that use of equipment should only be for research or classroom activities
- Students gave list of equipment and resources they would love to have access to

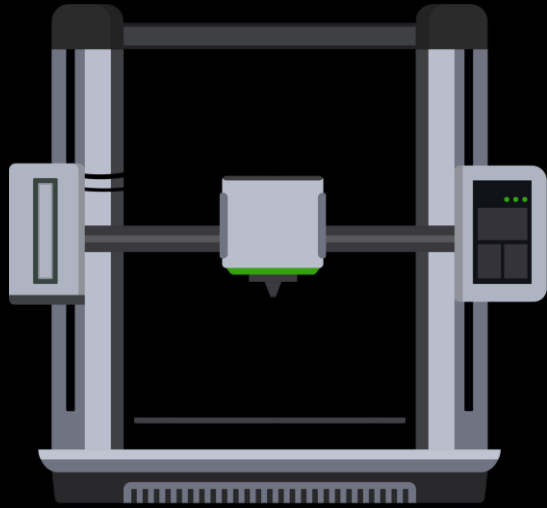


KEC MAKERSPACE

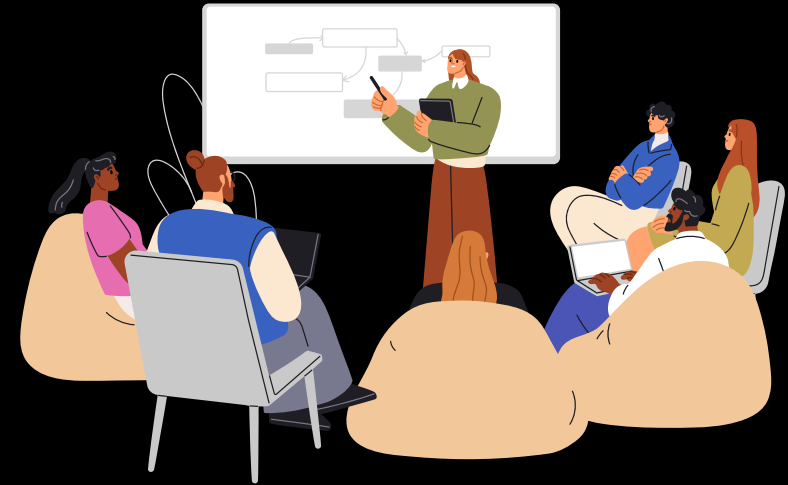
YOUR SPACE TO CREATE



Prototyping



Workshop & Events



Entrepreneurship



Impact



KEC Makerspace : Your space to create



Students:

- No cost for use of equipment
- Low consumable costs
- Prototyping tools
- Workstations and spaces for collaboration



Faculty:

- Access tools for research and prototyping
- Our team can work with you to create tailored classes that utilize the Makerspace



Industry:

- We can work with you and your team to create workshops
- Consider using the space for prototyping
- Challenge our students to solve your problems

Our Tea



Prof. Hirendra Man Pradhan
Chairman, KEC



Apekshya Koirala
Makerspace coordinator



Bistrit Poudel
Technical Lead



Prasanna Jibi Ghimire
4th year, Civil Eng. Student
Makerspace Intern



Arushi Pradhan (Ph.D.)
External advisor



Pratima Pradhan (Ph.D.)
Head of Research, KEC
Advisor

<https://kec-innovation.github.io/makerspace/>

