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The Design of an Immersive Informal Learning Space for STEM Education

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ABSTRACT

Given that learning is a social activity, space design should create comfortable, immersive spaces for learners to meet and collaborate, yet how students use and perceive these spaces has not been well studied.

Examining students’ use of immersive informal learning spaces is vital to space design. This study explores students’ experience in a space called the **Idea Garden** and elaborates on our experiences in designing immersive informal learning spaces.

BACKGROUND

The **Idea Garden** (<https://ideagarden.iupui.edu/>) at IUPUI was designed with the goal of encouraging STEM students to think creatively and tcollaborate with their peers.

The physical space is equipped with *3D printers, high-performance PCs, virtual reality (VR) headsets, Dell Canvas, Microsoft Surface, and an IQ-Wall Touch.*

In addition, workshops, online training resources, and other services are provided to support students’ use of the space.

MATERIALS and METHODS

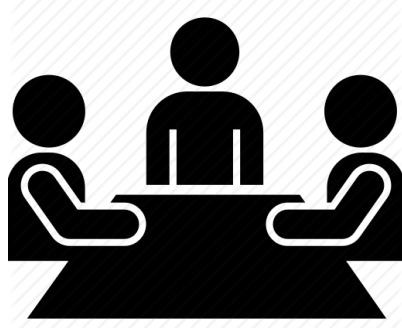
This case study examined students’ perceptions of the Idea Garden through a **survey** and **focus group student interviews**.

Survey



N= 458

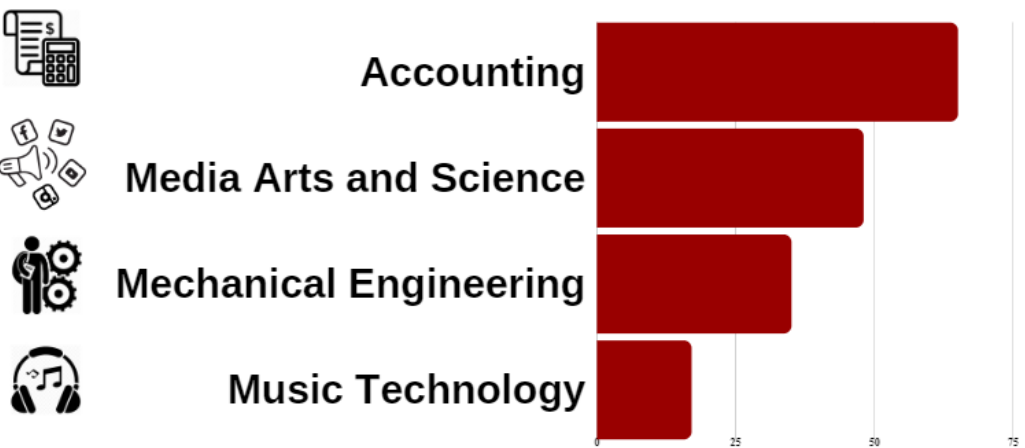
Focus Groups



N= 9

RESULTS BLOCK 1

Gender	Count	Class Standing	Count
Male	303	Freshman	181
Female	116	Sophomore	89
Prefer not to respond	13	Junior	70
N/A	19	Senior	62
Other	7	N/A	21
Total	458	Graduate	20
		Other	15
		Total	458



RESULTS BLOCK 2

Why do you want to come to Idea Garden?

Students came to the space with four primary purposes:

- ✓ Curiosity (219)
- ✓ To try out new technologies (93)
- ✓ To hang out with friends (51)
- ✓ To work on class projects (33): Photoshop, Illustrator

What do you like MOST about Idea Garden?

Students most liked using the following technologies:

- ✓ Virtual reality headsets
- ✓ 3D Printers
- ✓ Interactive whiteboard
- ✓ Microsoft Surface (desktop)

RESULTS BLOCK 3

How many times have you visited the Idea Garden so far?

	Female	Male	Other	Prefer not to respond	N/A	Total
More than 10 times	12.9%	28.3%	14.2%	--	17.6%	22.9%
Six to 10 times	12.9%	10.3%	14.2%	38.4%	11.7%	11.9%
This is my first time	50.0%	31.0%	71.4%	38.4%	29.4%	36.6%
Two to five times	24.1%	30.3%	--	23.0%	41.1%	28.4%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

- 50.0% of females reported that they visited once so far.
- Idea Garden has been visited “more than 10 times” mostly by male students (28.3 %).

	Freshman	Sophomore	Junior	Senior	Other	Grad	N/A	Total
More than 10 times	31.1%	29.2%	5.8%	14.7%	6.67%	25.0%	15.7%	22.9%
Six to 10 times	11.1%	7.8%	18.8%	13.1%	6.67%	10.0%	15.7%	11.9%
This is my first time	33.3%	32.5%	40.5%	42.6%	66.67%	40.0%	26.3%	36.6%
Two to five times	24.4%	30.3%	34.7%	29.5%	20.00%	25.0%	42.1%	28.4%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

- 42.6% of the seniors reported that they visited once so far.
- Idea Garden has been visited “more than 10 times” mostly by **freshman** students (31.1 %).

RESULTS BLOCK 4

What can we do to improve the services and technologies at Idea Garden?

- More power outlets; especially more at the center of the room please
- Clearer instructions on how to use specific tools and their purposes
- The constant work on the printers makes it so hot and loud
- Be more culturally diverse
- Provide a snack bar and tea
- Have music

- Self-directed learning experience
- Coffee-house features

RESULTS BLOCK 5

For me, I live on the campus. You know this is a very good study place for me. So, I used to come here and study over at one of those tables. I just do whatever assignments that I had to complete. You know this is a really fun and interactive place to come here and finish my assignments. And if I need to get some stress relief, I just come here to play some video games.

CONCLUSIONS

- **3D Educational Tools**
 - Google Earth
 - Human Anatomy
 - Practicing Public Speech
- **Physical Space of Idea Garden**
 - Group Projects
 - Interdisciplinary Interaction
 - Stress Relief

REFERENCE

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