

WHAT TRANSFERRED

FROM CAPSTONE TO MY FIRST WORK EXPERIENCE

The Capstone to Work (C2W) research team studies students' experiences in the transition from capstone engineering design courses to the workplace.

Data come from a cohort of 60 engineering students from 4 universities

85%

"I would say the best three things about capstone would be that it teaches you to **manage your time** and your **resources**

It teaches you to **work with other people** in a team to get a goal accomplished.

And then, the third is **learning how to find information** that you don't already have"



1. SELF DIRECTED LEARNING

74%

"I think by far the biggest thing that I've taken from the capstone projects is **technical writing**.

Actually, just **technical communication** in general.

...It's important in the industry. It's probably **one of the most important things...**"

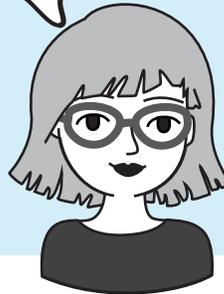


2. TEAMWORK AND COMMUNICATION

45%

"I felt the capstone was a really good prep. I got a lot of **manufacturing experience**, a lot of **CAD**.

... It was the **closest thing** in college I had to **projects I deal with now.**"

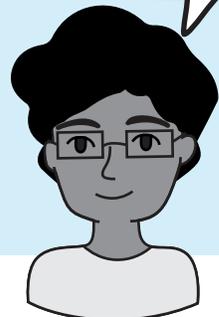


3. TECHNICAL WORK

"Every time I think of my senior design project, I'm pretty thankful that it happened. **Because it definitely helped me the most ...**

... I think that'll be maybe trying and maybe difficult.

But, that'll be where you **really learn if you like engineering.**



4. IDENTITY DEVELOPMENT

WHAT TRANSFERRED FROM CAPSTONE

1. SELF DIRECTED LEARNING

Managing and monitoring one's own time and knowledge

including ...

- finding resources
- time management
- work ethic
- finding work or keeping busy
- time pressure
- lack of knowledge

85%

"I would say the best three things about capstone would be

that it teaches you to **manage your time** and your **resources**

It teaches you to **work with other people** in a team to get a goal accomplished.

And then, the third is **learning how to find information** that you **don't already have**"



"I feel like in [capstone], I got to **learn a lot** for the project because there was a lot of things I didn't know,

and so I feel like it's helped me to realize that **it's possible to learn everything** and to complete a project **even though** I don't know much about it going into it.

I feel like it's helped me to **know how to ask questions** and how to **research things** and to **know what questions I need.**

So I feel like it's helped me in that."



"I guess in **Capstone** we still had to **as a team** come up with intermediate goals

and I guess right now, that part has **translated over**

because I really have to mainly **come up with a lot of my own intermediate goals** to really try to keep moving forward..."

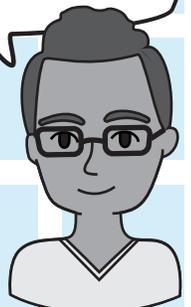
"With **Capstone** you're just kind of **given an idea**, take these semesters, come back with a product.

We have **guidelines**, but at the end of the day **you have to make it happen.**

"At first it was a bit **overwhelming** but once you learn to just **take a step back**, take a breath, and realize that it's the **same thing** that I was doing in college in **capstone**, but **just larger...**"



I think that **initiative**, that you have to develop if you don't already have it, in senior design **definitely translates to R&D.**"

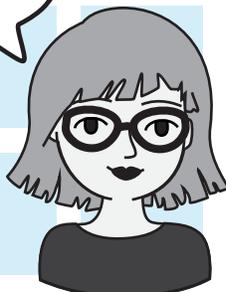


"I kept a journal through all four semesters of capstone and it's **proven valuable.**

I can go back to my capstone and I say oh so **if a problem presents itself** now here at [Company], **I did something similar** in school

and I'm not sure what to do, I can just go **back and look at my journal** and see how I did it there

and **it'll give me a direction** at least to go in to solve the current problem."



WHAT TRANSFERRED FROM CAPSTONE

2. TEAMWORK AND COMMUNICATION

Working in teams or communicating clearly

including ...

- client meetings - team meetings
- formal & informal presentations
- interpersonal communication
- formal & informal writing - team functions
- project planning & logistics

"I think by far the biggest thing that I've taken from the capstone projects is **technical writing**.

Actually, just **technical communication in general**.

...It's important in the industry. It's probably one of the **most important things...**"



"So definitely something that I learned ^{was how to know} **when to just ask someone a question** or just ask a few questions

versus, have a sit down meeting with multiple people because it's not always needed."



74%

"And I feel that **sponsor interaction**

is one of the **biggest things I took away from capstone** and one of the most useful."



"There's also the **team work aspect** ...I still see bits of that in terms of collaboration and **knowing how and when to collaborate** on different parts of projects,

sharing ideas or knowing **when it's a good time to check in** with someone else and **ask for feedback** on different parts that I'm working on.

I think that's something **Capstone helped me be better at** and I'm seeing it come into play more and more with work ...



...different **personalities, different backgrounds,** things like that, and that's **definitely applicable to the real world.**



"I feel like my capstone pretty much **got me my job.**

I think just **having all those professional skills** that we learned through that year and that course **really helped me...**



WHAT TRANSFERRED FROM CAPSTONE

3. TECHNICAL WORK

Engineering design and technical work

including ...

- CAD modeling
- prototyping & testing designs
- defining requirements
- engineering calculations
- generating & refining design concepts
- project budgeting
- using software
- handling ambiguity & uncertainty
- working with tools & equipment

"Learning how to deal with a budget [is something] capstone does pretty well.

What I do now is on a much larger scale but the premise is basically the same.

You have a **target cost** that you want to get under ... but you can't really go over without having a **good explanation** for it.

You kind of have to **weigh every decision** you make on a cost basis for the job, and for what we did with capstone."



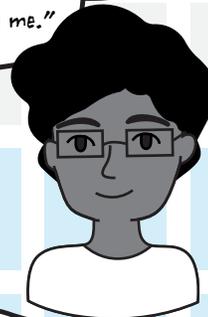
"I felt the capstone was a really good prep. I got a lot of **manufacturing experience**, a lot of **CAD**.

... It was the closest thing in college I had to **projects I deal with now.**"



"There was a lot of **requirements analysis** in that [capstone] design course, so being in that **mindset of designing** everything you're making around the requirements is good.

I think that prepared me."



45%

"Yeah, **programmable logic controller [PLC] programming.**

I knew I was going to the job and I knew this was **the kind of job I wanted** - controls engineering - back before I signed up for a capstone project.

"We used a lot of the **same tools**

...like **cost analysis** and the **risk assessments** and ...the **voice of the customer** stuff

... so it really did seem like **a lot of the same here [at work]."**



"Each project [at work] is kind of like a capstone project.

You still have to go through just **generating a concept**, and then you have to go through **design and testing**

and **figuring out what the cheapest way to manufacture the product is,**

and a lot of different aspects that really work **similar to what I do now."**



"... I actually got to program a **PLC** in my capstone class.

It was very simplistic ... but I still got the experience, which is very helpful."



WHAT TRANSFERRED FROM CAPSTONE

4. IDENTITY DEVELOPMENT

Seeing oneself as an employee and/or an engineer

including ...

- learning one's role
- feeling competent
- thinking like an engineer
- having a sense of belonging
- experiencing responsibility and accountability

Capstone definitely helped me work with clients, product development, teamwork, communication, and innovative thinking.

Key experiences needed for other projects.



"Every time I think of my senior design project, I'm pretty thankful that it happened. Because it definitely helped me the most ..."

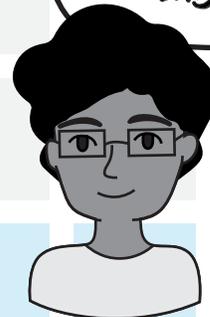
... I think that'll be maybe trying and maybe difficult.

But, that'll be where you really learn if you like engineering.

"I feel like capstone did a really good job of putting me in the position that I needed to be to learn what I needed to do to be a good engineer."



And it'll be where you really learn how to be an engineer."



I didn't really know if it was my place to say anything, but this past meeting I spoke up and I was like, "I'll get [the cost info] for you." So I was kind of taking the lead on it.

That's something I did in capstone with gathering our materials and doing the costing of those things.



34%

Adapting to problems was what our senior design capstone was supposed to be about.

I think I have those adaptability skills now and I was able to implement them into my work.

