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.”

“I think by far the biggest thing that I’ve taken from the capstone projects is technical writing. Actually, just technical communication in general. And it’s important in the industry, it’s probably one of the most important things…”

“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.”

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

74%
...I think that will be maybe trying and maybe difficult. But, that will be where you really learn if you like engineering.

34%
And it will be where you really learn how to be an engineer.”

45%
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cdhub2.org/links/c2w
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

1. Self Directed Learning

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

85%

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

"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 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."

"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 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..."

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

"The third is learning how to find information that you don't already have."

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2. TEAMWORK AND COMMUNICATION

"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..."

"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..."

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

"And I feel that sponsor interaction is one of the biggest things I took away from capstone and one of the most useful."

"Sharing ideas or knowing when it's a good time to check in with someone else and ask for feedback I think that's something capstone helped me be better at and I'm seeing it come into play more and more with work..."

"I think that 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."

"With the group that I was part of and with all kinds of people... different personalities, different backgrounds, and that's definitely applicable to the real world."

"Working in teams or communicating clearly including... - client meetings - team meetings - formal & informal presentations - interpersonal communication - formal & informal writing - team functions - project planning & logistics..."
3. TECHNICAL WORK

Engineering design and technical work

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

"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."

"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.

... 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."

"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."

"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."

"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]."

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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.

“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.”

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.

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.

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.

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