THOMAS LANCASTER

Young Inventor is Patently Impressive

This budding engineer has used his student internship to make a career-defining accomplishment – before he even graduates.

Story written by Mark Cox

Thomas Lancaster's path to engineering was anything but straightforward.

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Despite inheriting a keen interest in building things from his engineer dad and artist mom ("I was drawing up blueprints for inventions when I was seven years old", he recalls), he was told during high school that his math skills were insufficient for engineering school.

Undeterred, Lancaster embarked on a roundabout, topsy-turvy journey toward realising his dream.

First, he became a welder, building up core skills. Then he got a one-off opportunity to work for a robotics company, where the gifted engineers shared his passion for finding creative solutions to complicated problems.

That ultimately led to him starting a Mechanical Engineering degree in Kyoto, Japan, which he has now come home to finish in his home state.

"At this point, my experience and diverse manufacturing background gives me an advantage where many engineers might struggle," he said. "I understand how things are made and how to make them, and therefore how to effectively design parts for manufacturability."

Daunting task

When he arrived back in Colorado to continue his degree, Lancaster really landed on his feet in terms of future career prospects.

The reason: For the past two years, MSU Denver has been a workforce-development partner for the National Science Foundation's ASCEND Engine, which supports students studying in priority areas centered on resiliency and climate tech innovations.

This support has enabled scores of MSU Denver students – including this one – to access some incredible student

internship opportunities with a broad range of pioneering agencies and companies.

Last year, Lancaster secured an internship role as a Systems Engineer with PAGE Technologies, a start-up that builds precision monitoring systems for water and soil management.

Once there, he was sent a daunting task. The company had developed new chemical sensor technology that is capable of measuring how much fertilizer is in water – but needed a device to house it in.

Lancaster quickly got to work creating a mechanical structure – and then added all the parts, pumps, microcontrollers and electronics that would ultimately lead to a new invention: the Autosampler System Adapter.

Elliot Strand, Co-Founder of PAGE Technologies, was delighted. "Thomas has been a fantastic addition to the team," he said. "He has brought valuable industry and manufacturing experience, and taken real ownership over designing, building and validating this product from the ground up."

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While Lancaster's work has directly shaped what will become PAGE's first product offering, he also brought another, less tangible quality – being good company.

According to Strand: "Within our highly interdisciplinary team, Thomas has been a great collaborator – open to feedback, quick to learn, and consistently thoughtful in how he communicates and grows."

Dream role

Throughout his career, Lancaster has been involved at one time or another in every stage of the creative process – such as concept development, preliminary design, prototype planning, testing and final design. But it was only at PAGE that he had the opportunity to work through every step towards getting his product customer-ready, and that was a transformative experience.

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“Every engineer dreams of seeing their technology come to life,” he said. “I am fortunate to be part of a team that collaboratively has made that dream a reality.”

More good news: Lancaster looks set to remain a part of that team for a while yet: “PAGE has asked me to stay on after this internship is finished, so I am currently working part time with them while I finish my degree.”

Experience is the best teacher, he added, so he counts getting a chance to continue working with the company as hugely valuable and a deep honor.

For Strand, making the decision to keep Lancaster around was a no-brainer. But the PAGE leader has also bought into the NSF ASCEND Engine’s broader goal of harnessing young talent now as an investment in the future.

“Training and supporting the next generation of STEM talent is essential if we want real progress on the agricultural challenges we face,” he said. “Supporting interns like Thomas is one way we try to help people find meaning and purpose in their work.”

He added: “We hope experiences like this encourage young engineers to think bigger about their careers and the positive change they can help create.”

Power of persistence

Given that his own arduous path to success – full of passion, heartache and grit – has turned out so well, Lancaster is keen to offer encouragement to the next generation of would-be engineers at MSU Denver.

“If you’re thinking of taking an engineering course, understand that the classes are very difficult – but I’m an example of how someone can persist when all the odds are against them,” he said.

While his weak math foundation was a significant hurdle to overcome, Lancaster now recognizes that it was also the challenge he needed in order to grow.

“My own journey to engineering has been an organic one, so I would advise others to simply follow their own drives and passions, and be honest with themselves,” he said.

And also: future students should know that lacking confidence in mathematics is not a reason to give up. “Math skills do not define a good engineer – they are merely one tool in an engineer’s toolbox,” he said.

Patent holder

While the NSF ASCEND Engine partnership has seen more than 80 successful student internships in the past couple of years – covering topics as diverse as AI hubs and dung beetles – Lancaster thinks his particular experience with PAGE Technologies would be pretty hard to beat.

“This is an amazing company,” he said. “I have been exposed to the cutting edge of electrochemical research technology – and the critical work we’re developing now will ultimately change the way our world views agriculture.”

Lancaster initially came into his MSU Denver degree with vague hopes of establishing potential building blocks for a future career. Instead, he found himself being nurtured by an ambitious company populated by numerous experts across several fields, who gave him the freedom to learn and grow and create. “For me to be a piece of that puzzle, it’s just amazing,” he said.

As things stand now, Lancaster is working for his dream company, his invention is being manufactured and he will shortly graduate with a Mechanical Engineering degree – the sky’s the limit. Plus, there’s one more cherry on top.

“The Autosampler System Adapter is now being patented and I’ll shortly be named as a primary patent holder, before I even graduate,” Lancaster said. “That will be a huge milestone for me – as it would be for any engineer, for that matter.”