

## 3D printing lab gears up to fight Covid-19 pandemic

When the Division of Orthopaedic Surgery at Stellenbosch University (SU) started a 3D printing laboratory about two years ago to assist surgeons in planning and rehearsing surgical procedures, they had no idea the lab would be put to use in a pandemic. Today, staff and students are working long hours to 3D print and assemble visors to be distributed and used as protective gear for those working on the frontline of fighting the Covid-19 crisis.

Dr Rudolph Venter, an orthopaedic surgeon and lecturer in Clinical Anatomy at SU's Faculty of Medicine and Health Sciences (FMHS) came up with the idea after the virus broke out in South Africa.



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"I thought, why not put the 3D printing lab to good use by producing some kind of protective gear for the healthcare workers working with patients?" said Venter. After consultation with Tygerberg Hospital management, face shields were identified as an immediate need.

"There is a burgeoning community of people all over the world using 3D printers and laser cutters to produce equipment for healthcare workers, sharing designs and refining them, all being shared freely online - it is beautiful to see," said Venter.

He and his team downloaded a design that met a range of different criteria and started sourcing the material to make them.

"The headgear comprises a plastic headband to which you attach a clear visor, with elastic to attach it to the wearer's head.

We approached local suppliers who sold sheets of clear plastic and elastic and used a few rolls of 3D printing filament that we had in stock in our lab."

The head of the Division of Orthopaedic Surgery, Professor Jacques Du Toit made funding available to purchase some of the materials and kick-start the process.

"We soon realised that we were not going to make much of a difference with just one printer, so we approached the SU's Faculty of Engineering, and Prof Kristiaan Schreve, head of Mechanical Engineering, very graciously put all the 3D printers they could spare at our disposal," said Venter.

## Fighting the good fight

It didn't take long before Venter also had a network of community volunteers producing the same design on their home 3D printers. A local engineering firm, Rapid 3D donated 10 more rolls of filament and consumables for the printers being used. Another donation was from Curro schools head office, which donated 20 more of the visors.

Venter then contacted Luné Smith, a fifth-year medical student who, along with a fellow student Abdul-Mutakabit Aziz helped set up a student-volunteer initiative when the pandemic broke out in South Africa. Hundreds of medicine and health sciences students at the FMHS have opted to use their recesses to play their part in fighting the virus.

Smith runs the WeFightBack Covid committee which is involved in five student-volunteer projects, ranging from a community mask initiative; to making spacers for metered-dose inhalers to use in place of nebulization to treat Covid-19 patients; to a support project for people in kangaroo mother care wards and lodger areas, as well as an education initiative relating to the virus.

Smith and her team have taken over the logistics of the 3D printing project, on top of their other projects.

"We take care of all the odd jobs, including dropping off the plastic for the community volunteers to print the masks; picking up the printed masks; picking up materials for making the visors as well as putting them together – cutting them out, measuring them and assembling the product," she said.

*“ We are a country that's spent enough time hurting one another. We're now at a place where we are caring about and helping one another. This pandemic is making us face the problem together. We are all the same. It feels right. ”*

The students assembling the visors are working in the orthopaedic surgery department, in shifts of four or five people at a time so as to maintain social distancing.

"After our stocktake on 6 April, we are proud to report 134 visors are ready to go, with more on the way," said Smith.

"Luné and her team took the whole production line out of my hands. In fact, the whole project has been taken out of my hands by students, staff and community members who have 3D printers at home and who found out via social media how they can also assist in getting these visors made and are donating them to us. It has been so inspiring to see how much initiative these students have shown and just how hard they work," said Venter.

Smith said it feels "surreal" to be working together in the midst of a pandemic.

She said the camaraderie among the students has been "beautiful" to witness. It's been amazing to see the teamwork among staff and students alike.

"We are a country that's spent enough time hurting one another. We're now at a place where we are caring about and helping one another. This pandemic is making us face the problem together. We are all the same. It feels right," she said.

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