

## 3-D printing technologies transport students to ancient greece

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The use of 3-D printing technologies in Victoria University of Wellington's Classics Museum has students using ancient Greek artefacts the way they were intended—from interacting with 3-D printed ancient objects to designing their own amphorae (storage jars).

Dr Diana Burton, senior lecturer in Victoria's School of Art History, Classics and Religious Studies, wanted students to have practical experiences with the objects in the Museum without risking damage to the historic pieces.

"In Greek art, pretty much everything is functional—they don't really have art for art's sake," she says.

"In order for students to really get to grips with the way the use of an object has informed its [design](#) and decoration, they need to be able to use it and handle it in the ways the ancients did. 3-D [printing](#) objects is a safe way to facilitate this."

Together with Victoria's School of Design, Dr Burton has been taking digital scans of items in the Classics Museum and having them 3-D printed.

The first project was 3-D printing a kylix, a drinking vessel that ancient Greeks used to play drinking games.

"We have a collection of ancient pottery in the Museum and one of the

shapes is a shallow bowl with a stem and handles," says Dr Burton. "The ancient Greeks used it in a drinking game where they held the handle and flicked the dregs of the wine at a target. So we filled them with water and had the students engage with the object in the way it was designed by the Greeks."

Students also had the opportunity to design their own amphora. The students drew black figure illustrations using a supplied template, which were then digitally scanned and mapped.

"The students had to illustrate the amphora with an appropriate Greek myth," says Dr Burton. "It needed to fit into their personal story and social content, the same way the Greeks did with their decorations."

Five students have had their creations 3-D printed. The winning designs focused on a range of contemporary subjects from student finance struggles to the 2009 Samoa earthquake and tsunami.

"Coming up with a design for the amphora was great fun—it was the most fun I've ever had doing an assignment. I really enjoyed the hands-on aspect," says student Isaac Bennett-Smith.

"I think it was a really good way to learn. It doesn't completely replace writing but it would be a bit naïve to assume writing is the only way we can communicate ideas. It's really good to incorporate that visual literacy into subjects like Classics."

The process was guided by Industrial Design lecturer Bernard Guy and Master of Design Innovation graduate Zach Challies, who specialises in high-end multi-property 3-D printing. Zach designed the template for students to draw their amphora design, digitised each design for 3-D modelling, and did the original experimentation to ensure they would print correctly as full colour 3-D printed objects.

The designs were printed in New York at Shapeways—the world's largest online 3-D printing service provider.

The project has been hugely worthwhile for both parties, demonstrating how students and academic researchers can work towards a 3-D printing enabled university, says Bernard Guy.

"It's fantastic to see ancient culture and items that are thousands of years old meet the digital future. It's not an obvious meeting, but one that resulted in a valuable experience for the School of Design and tangible learning tools for the Classics programme.

"3-D printing allows the unexpected to become reality—it opens avenues to tell entirely new stories, make entirely new discoveries, and to truly unlock the possibilities of the digital age. We're interested in finding other areas of the University where 3-D printing could become an effective teaching or learning tool."

Dr Burton hopes to use the technology to create an online 3-D gallery of Victoria's Classics Museum.

"Museums are increasingly looking at 3-D technology as a way of making their collections available. We've scanned almost 30 pieces that we want to make available on the website—having an interactive 3-D image allows the viewer to interact and see how the whole design functions."

Provided by Victoria University

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