3D printed Cypriot figurines: 'playing' with musicians at the Ure Museum

3D PRINTED CYPRIOT FIGURINES
'PLAYING' WITH MUSICIANS AT THE URE MUSEUM

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INTRODUCTION

The educational programme of the Ure Museum of Greek Archaeology is closely linked to pedagogies of active and experiential learning, which sees hands-on engagement with the object of study as a key to long-term retention of ideas. The Ure Museum is an integral part of the Department of Classics at the University of Reading, known widely for its collections which include the fourth largest collection of Greek ceramics in Britain. Among its artefacts from other Mediterranean civilisations are approximately 100 Cypriot artefacts[1], of which at least 50% are liberally distributed throughout the museum's thematic displays on myth and religion, household, technique & decoration, etc. Yet our Cypriot collection remains relatively unused because Cyprus is little 'studied' by our visiting primary pupils. Our decision to forefront Cyprus in the utilisation of new – especially 3D – technologies is in part motivated by an effort to make better use of the Cypriot holdings.

Object-based learning facilitates the understanding of a subject, the development of academic and transferable skills, such as teamwork and communication, lateral thinking, practical observation and drawing skills. A multisensory approach[2] can also trigger innovative dissertation topics[3] when applied to archaeology and related studies[4]. Concrete artefacts represent a vast continuum of abstract ideas and interrelated realities that are to be discovered by learners[5].

The value of object-based learning methods can be summarised with three premises[6]. First, objects are not age specific. They can be used by people of any age; only the methods of questioning and conclusions will vary. This also applies to people with differing learning skills[7]. Second, objects can be used to understand people's lives; the Ure Museum's display allows learners to analyse objects relating to people, events and traditions rooted in antiquity. Third, objects give us the chance to develop our capacities for careful, critical observation of our world; learners are encouraged to think beyond their everyday experience.

REPLICATING KAMELARGA FIGURINES AT THE URE MUSEUM

The focus of our project is a group of nine figurines formerly in the possession of Gore Skipworth, who claimed they had come from 'old tombs in Cyprus'[8]. These mixed technique terracottas, which date to the Cypro-Archaic period (750-480 BC) are probably from Kition. They are of the Kamelarga style, local to that site, which is characterised by a moulded face attached to a wheel-made body. We have five types traditionally identified as representing females and one understood as a male warrior. Because of the 'gifts' that they hold, and the findspot of many other Kamelarga types, these figurines have been interpreted as ex-votos that ensured prosperity and abundant crops[9].

[1] Pickup *et al.* 2015, p. vii.
[2] Romanek & Lynch 2008, p. 284; Biggs 2003, p. 80.
[3] Chatterjee 2010, p. 179-81; Chatterjee 2008, p. 215-223; Chatterjee & Hannan 2015, p. 1-8; Durbin *et al.* 1991, p. 7.
[4] Beazley 1989, p. 98-102.
[5] Paris 2002, p.10.
[6] Shuh 1982, p. 8-15.
[7] Kennedy 2016, p. 2.
[8] Pickup *et al.* 2015, p. 21.
[9] Karageorghis 1999, p. 217-218; Fourrier 2007, p. 23-37.

As part of our educational programme, we designed a workshop to delve into the function and symbolic meaning of these figurines, implementing new techniques and methodologies to expand our object-based learning pedagogies. Using photogrammetry techniques[10], our staff and team of volunteers and interns created 3D models of the artefacts using Photoscan (by Agisoft) and Blender. Two figurines, a female with tambourine and the male warrior (specifically 47.2.29 and 47.2.27) had been previously uploaded to our sketchfab site (sketchfab.com/uremuseum) (fig. 1). We started experimenting with them while the rest of the team received their training.

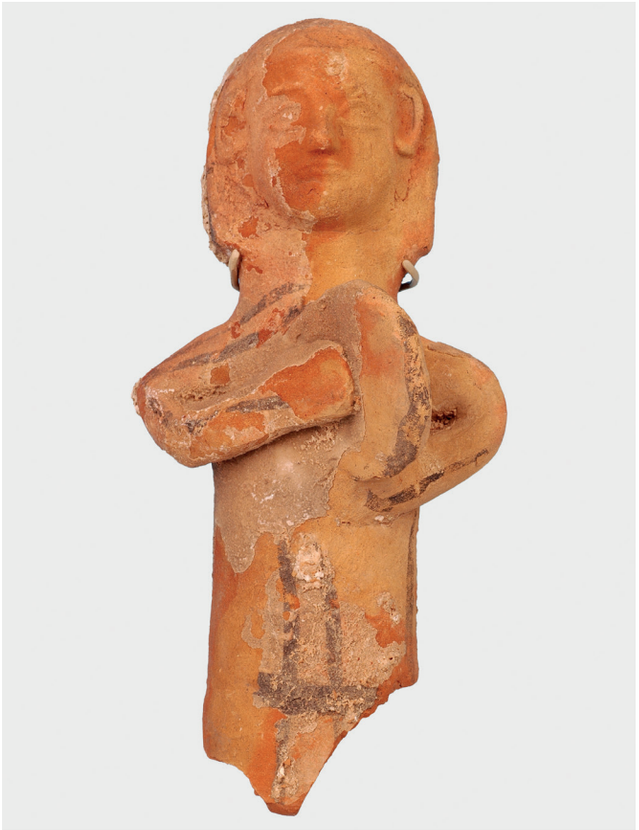

Fig. 1. Cypriot figurine of a figure holding a 'tambourine', Cypro-Archaic period (750-480 BC), Ure Museum of Greek Archaeology inv. 47.2.29 and its 3D model rendition on www.sketchfab.com/uremuseum (© Ure Museum, University of Reading)

We used our Cube Pro Duo printer (with ABS filament) and a few bespoke printers which relayed on PLA. To facilitate the 3D printing process, we created a new base for the fragmented figurines, which altered the height and resulting authenticity of the 3D print. The support used in the museum to secure the figurines vertically was not edited in Blender, hence it appears on the back of the terracottas as a thin pole attached to the back.

As Cypriot figurines were often found in great numbers in cultic context, we printed a large amount of replicas experimenting with different printing resolutions and textures. This was our way to engage also with materiality issues, such as scale, colour, texture, weight and iconography. The male warrior was printed in two light figurines, three heavier ones and one without artificial base, which is yet heavier. The 'tambourine' player was printed in four very heavy layered replicas, one as a mirror opposite, one in a larger scale, one in high resolution and another one with the base and concretions edited. (fig. 2 and 3)

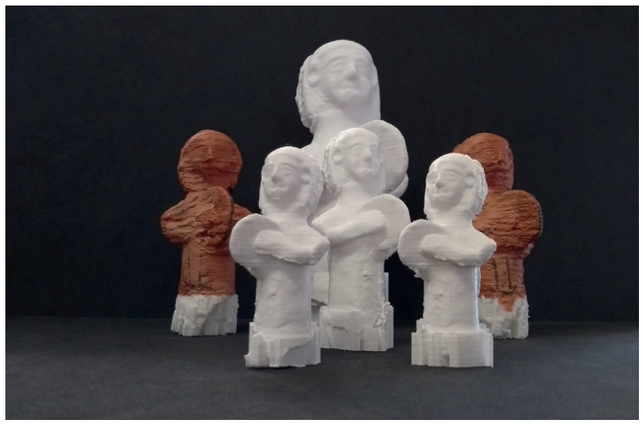

Fig. 2. 3D printed replicas of the musician shown in Fig. 1 (© Ure Museum of Greek Archaeology, University of Reading)

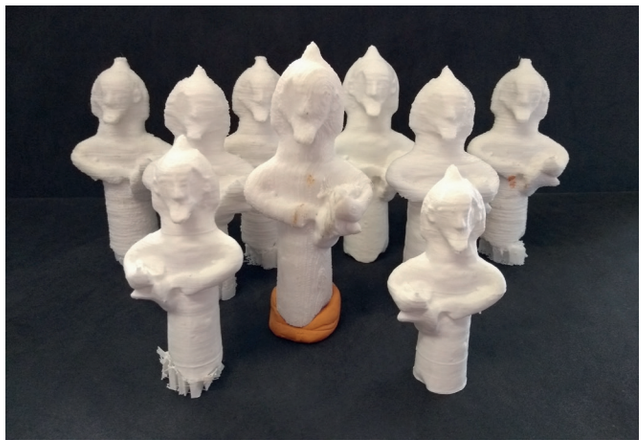

Fig. 3. 3D printed replicas of the Cypriot warrior, Ure Museum of Greek Archaeology inv. 47.2.27 (© Ure Museum of Greek Archaeology, University of Reading)

[10] Canon EOS 750D camera (ISO100, with an aperture of F8 and longer shutter speed) with tripod and two sets of lights.

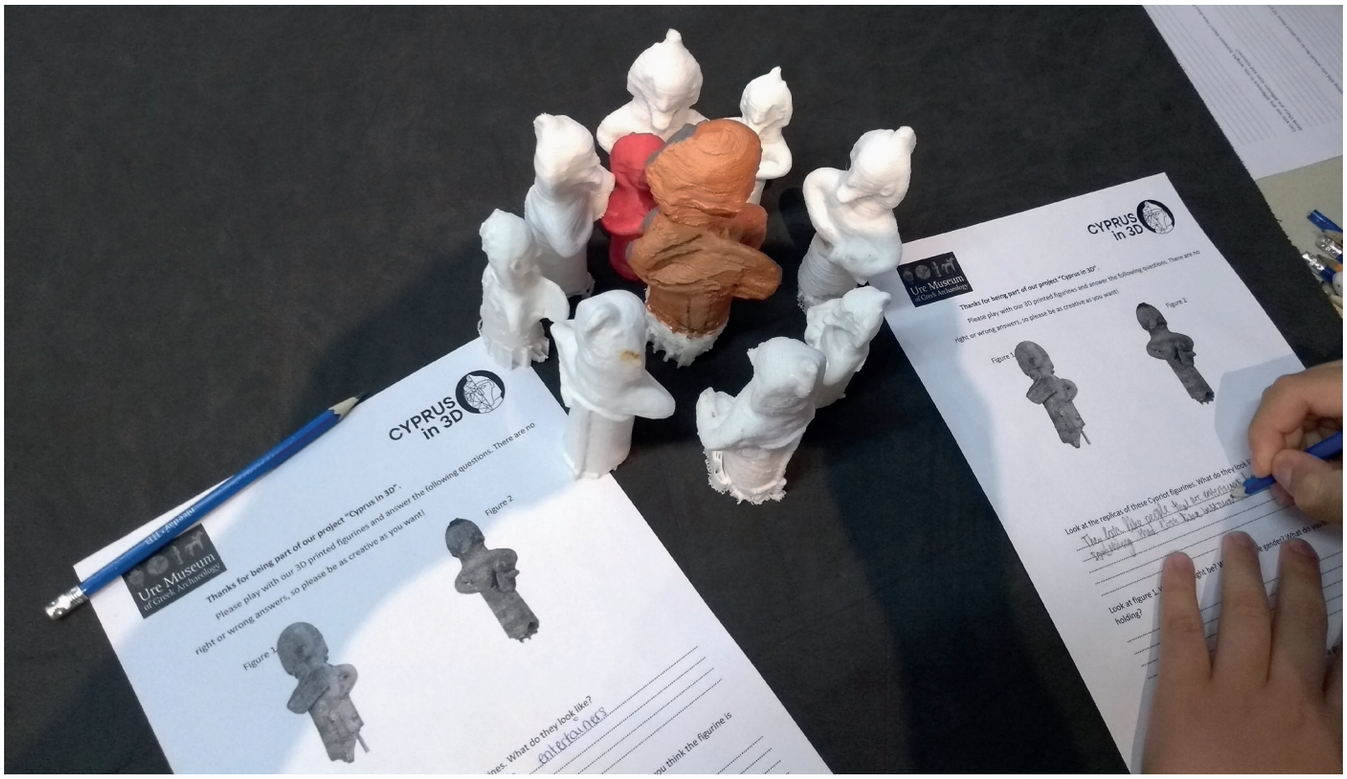

Fig. 4. Visitors handling 3D replicas in the Ure Museum of Greek Archaeology (© Ure Museum of Greek Archaeology, University of Reading)

ASSESSING FEEDBACK FROM EDUCATIONAL ACTIVITIES

Cyprus in 3D was the common thread in our calendar of activities for 2018-2019: we incorporated our figurines in many events to promote the collection as part of our outreach programme and audience development, in which everyone had the chance to play with our prints as a way to understand ancient religion (fig. 4). We encouraged responses from the participants with questions about: what the figures looked like; who they might represent; what genders they might reflect; what each figurine was carrying, with follow-on questions such as why they might be carrying these attributes; the position in which each figurine might have been found (standing, lying, all together, separated).

'Digital Classics' was an event hosted in the Ure Museum (28/03/2019), to celebrate new approaches to ancient civilisations, which provided us with an opportunity to test the pedagogic function of the 3D prints: we welcomed 50 people (5-65 years old). After handling them, visitors surprised us with their own opinions on the original function of these figurines, saying that they were gods or real people showing their everyday life, but turned into amulets or lucky charms for the afterlife, linking them to shabtis.

Our audience preferred the heavier replicas, which gave them the sensation that they were holding something important or 'real', as they put it. Although materiality was an issue, it was not as much of a hindrance as we had imagined: they quickly accepted that the surface of these artefacts was not that of the originals, but proceeded to play with them nonetheless.

Most of our audience considered the bearded figurine to be a male warrior or authority figure of some sort, holding a shield or weapon. They also spotted some resemblance to Egyptian pharaohs or shabtis, which enforced the idea that it was an 'important person'. The beardless figurine, however, was not identified as female in most cases, although when associated with the attribute it was considered to be a servant or a musician. Most visitors saw in the rounded shape a musical instrument (cymbals, tambourine, harp) while others any given offering (fan, discs, coin).

The different sizes were perceived as representing people from different ages or echelons of the society, being the

bigger ones more important, respected or richer. When asked about a possible interpretation for the whole set of figurines, they understood it as a family (the monarch's family) or a music band, with people playing instruments and dancing.

CONCLUSION

Our Cypriot 3D models and 3D prints have been displayed in informal learning environments, allowing people to freely interact with our collection and motivating discussions. Visitors from different backgrounds, ages and learning abilities engaged with our resources in similar ways: they overlooked the printing quality in some of the replicas and embraced the opportunity to touch and 'play' with copies of fragile artefacts that are usually safeguarded inside our cases. They all analysed the figurines as an expression of an ancient civilisation that showed an interest in music but also in war, a society with warriors and soldiers (males) and servants with food or musical instruments (females) that was once under the influence of Egypt, something that scholars have argued during the last century.

People preferred to interact with the 3D prints than with the 3D virtual models. With the sense of touch we recognise objects with different sizes and textures, which provide a 'tactile reality', sensations capable of generating mental images that are important for communication, aesthetics and concept formation. As we stated before, a sensorial experience can help to memorise new concepts and encourage an active mind, which is, in the end, the ultimate purpose of lifelong learning.

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