UCL ENGINEERING
Department of Civil, Environmental & Geomatic Engineering (CEGE)
↳3D Imaging, Metrology, Photogrammetry Applied Coordinate Technologies (3DIMPact)

# OBJECT-BASED TEACHING AND LEARNING FOR A CRITICAL ASSESSMENT OF DIGITAL TECHNOLOGIES IN ARTS AND CULTURAL HERITAGE

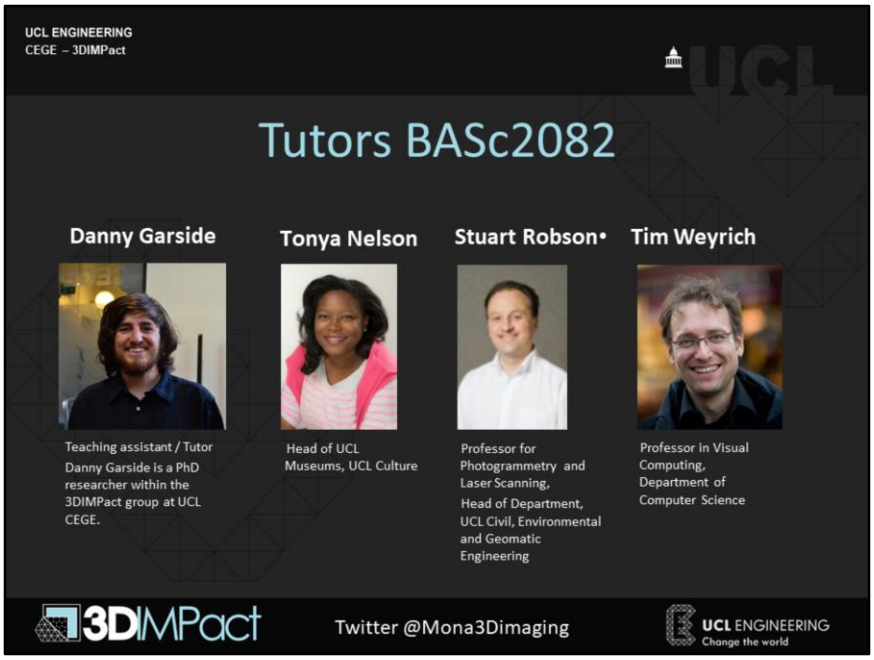
**M. Hess**

3DIMPact
3D Imaging, Metrology & Photogrammetry
Applied Coordinate Technologies

UCL Arts and Sciences

CIPA OTTAWA 2017
26th International Symposium

Max flexibility with requirements for a core set of courses , such as qualitative research and languages, but plenty of space for specialisation. Students can spend a year abroad in their 3rd year, and do their final thesis in the 4th year. Internships are part of the experience.

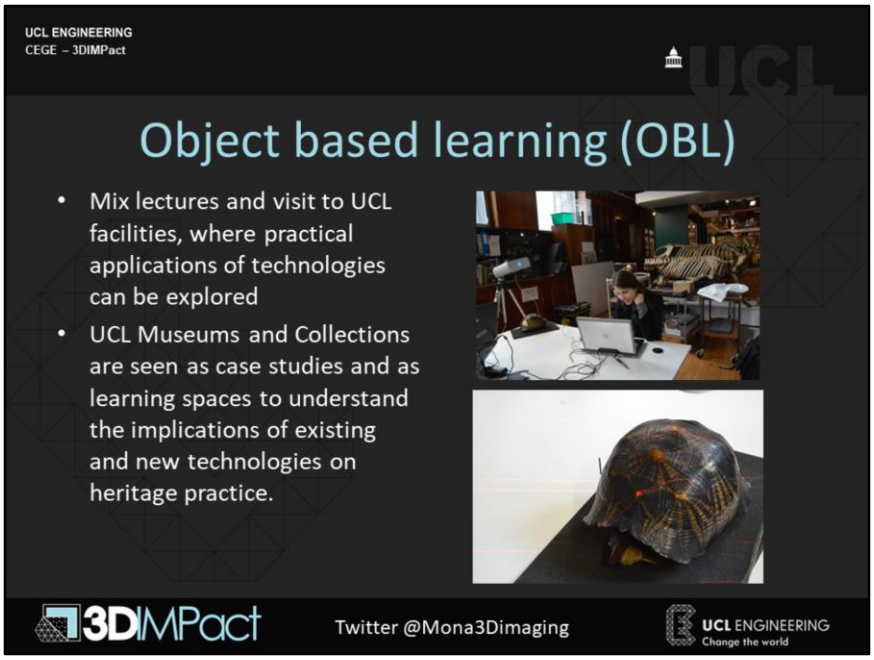



Interdisciplinary group of tutors

As cultural sector practice becomes increasingly dependent on digital technologies for the production, display and dissemination of art and material heritage, it is important that those working in the sector understand the basic scientific principles underpinning these technologies and the social, political and economic implications of exploiting them. This course aims to provide an intersection between the “Culture” and “Science and Engineering” pathways and prepare students to critically evaluate how technologies can be effectively used to support and advance cultural practice.

The objective of the course is to examine the role technology plays in the development, distribution and preservation of art and material heritage.

For example, students will examine how the invention of the camera spawned both a new form of artistic expression and reproduction method that put concepts of authenticity, originality and authorship into question. Students will then be asked to consider how this learning relates to cultural practice in the digital world.




It has been observed that the use of OBL as 'student-centred' and 'activity-based learning' will be beneficial to students as a strong way of internalising and retaining theoretical and applied knowledge. Seminars will mix lectures with visits to UCL's museums and other UCL facilities, such as the Digital Humanities Digitisation Suite, where practical applications of technologies can be seen.

…. and the consumption of art and material culture.

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# Learning

- Classroom and practical
- Electronic classroom
  - Online (Moodle)
  - Introduction to up-to-date hard- und software
  - E- reading list
- Assessment
  - Essays, exams,
  - but also Business Memo, 3D practical coursework, peer marking
  - Student presentations of projects in addition to written coursework to experts

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# Learning

- Research-led teaching
  - Reading and discussion of current press articles, (conference or journal pulications)
  - Dialogue with researchers
  - Projects in connection with ongoing research
- Object-based learning
  - On site, Teamwork
- Teaching outside the classroom
  - Visit to UCL facilities , galleries and ongoing project reports

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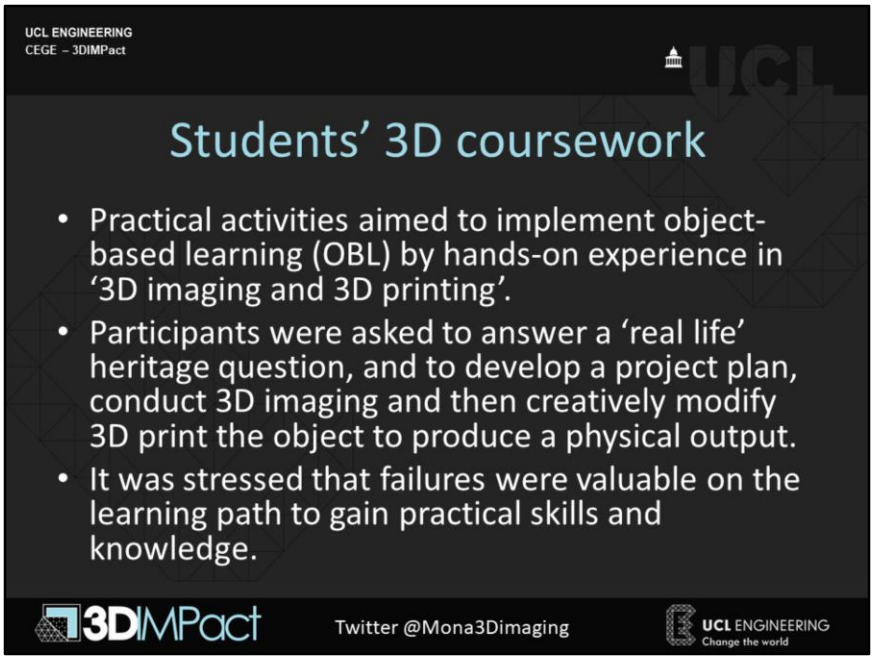
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Students' 3D coursework
• Practical activities aimed to implement object-based learning (OBL) by hands-on experience in '3D imaging and 3D printing'.
• Participants were asked to answer a 'real life' heritage question, and to develop a project plan, conduct 3D imaging and then creatively modify 3D print the object to produce a physical output.
• It was stressed that failures were valuable on the learning path to gain practical skills and knowledge.
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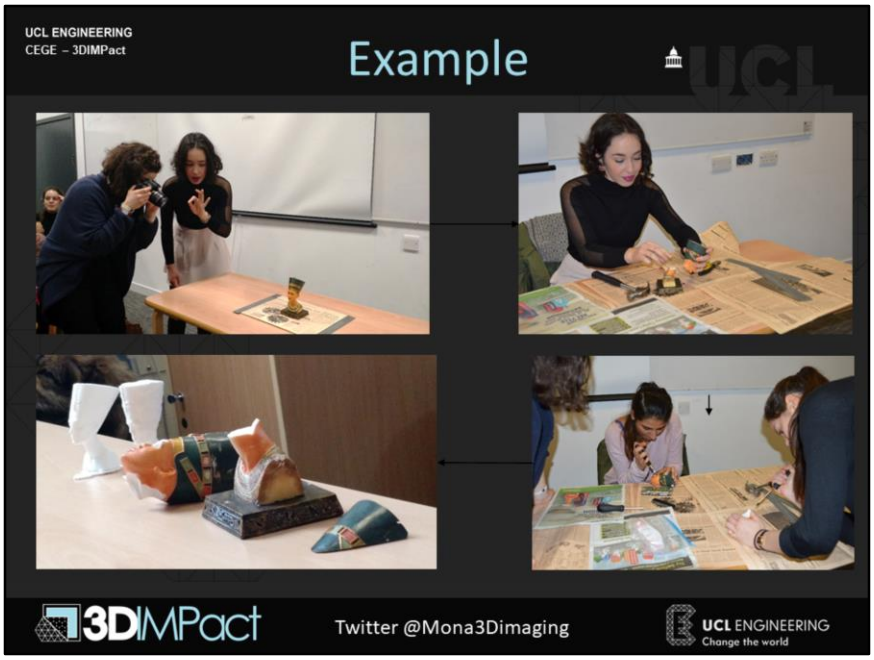
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Example
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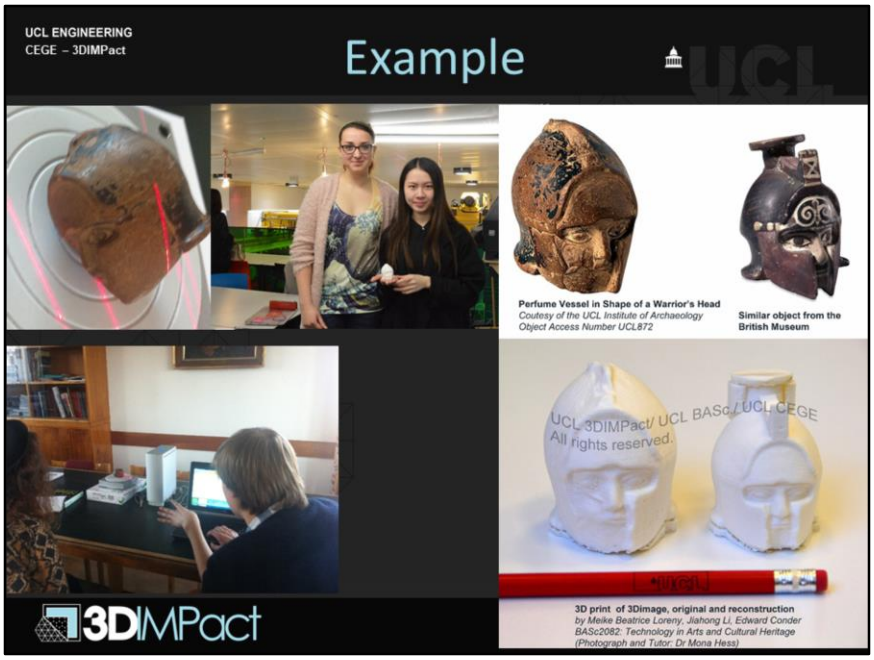
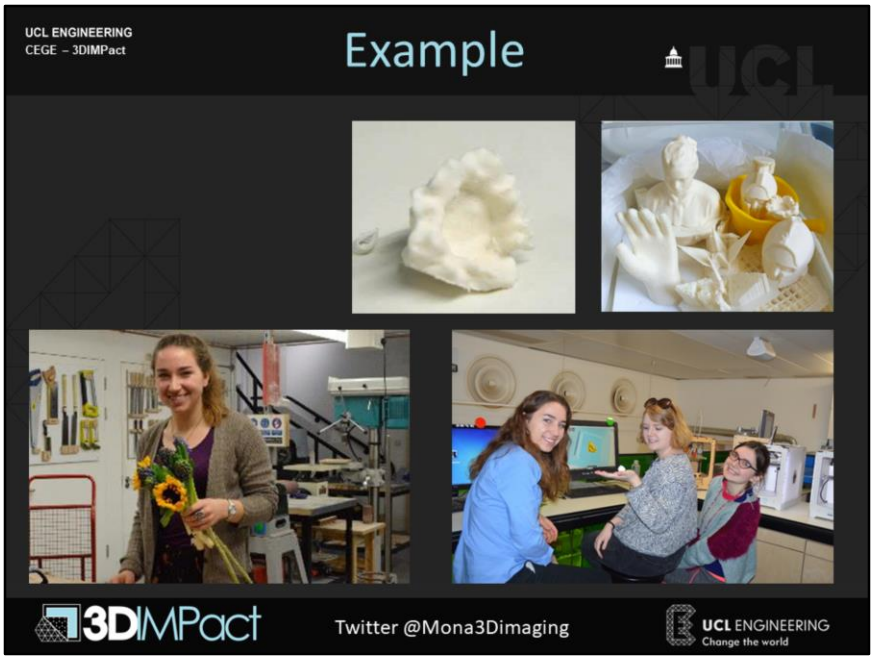



Students should be able to select an appropriate technique and use 3D imaging to develop a 3D model with enough depth to understand the advantages / disadvantages and the positive and negative of the outcomes from their work.




Danny, previous years students having fun at the Institute of Making doing their projects

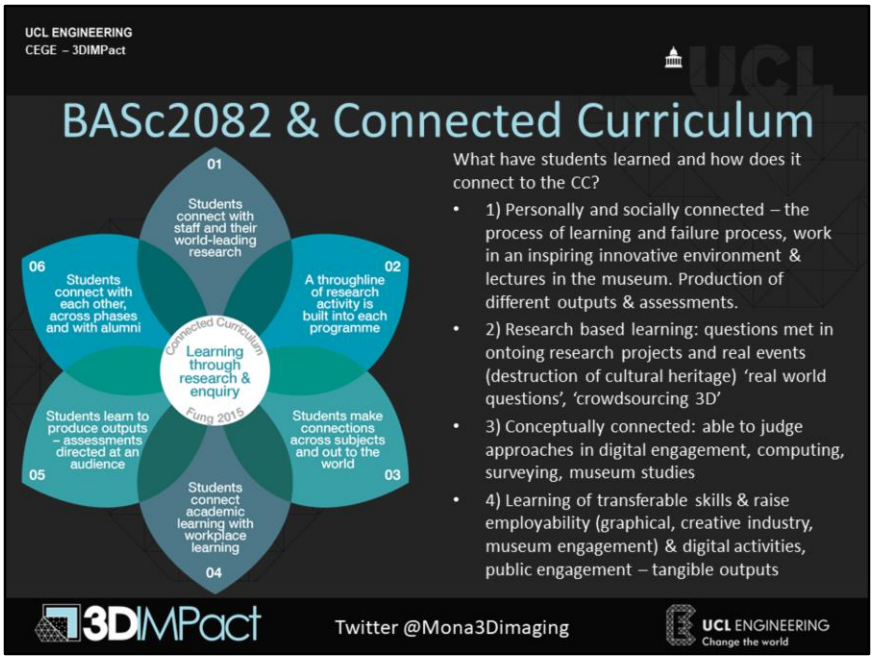
Our ‘real life’ museum questions:

**“What can we gain from a 3D reproduction of a museum object?”**
**“Can the 3D reproduction be a ‘surrogate’ of the original object?”**

At the end of the course, a multimedia presentation and written illustrated report of physical and digital products were presented. Students were conversant to discuss the relevance, advantages and disadvantages of 3D digital technologies for the museum with a newly acquired vocabulary

OBL proved to be of efficacy to instigate learning and successful acquisition of subject-specific knowledge: technological skills in the domain of graphics and visualization.

The engagement with the new digital technologies, learning curve and physical and digital outcomes of the course were of remarkably high quality.



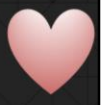

I have presented a new undergraduate module embedded in an interdisciplinary liberal arts degree.

At UCL, the Connected Curriculum (CC), is a benchmark for connecting research-based teaching and education at UCL, and its main aims are shown .

The engagement with the new digital technologies, learning curve and physical and digital outcomes of the course were of remarkably high quality.

Taught a diversity of assignments including traditional essay and business memo, for a museum , practicals: 3D imaging and photography

# Student evaluations



- *A little more teaching in the technology would be helpful. Super interesting practicals - never thought I would be able to do a 3D print!* ***But we did! Joy!***
- *Many case examples were presented to illustrate learning points in lectures & I especially enjoyed the practical applications of the course. Very enlightening & the course was structured well in terms of material delivery - methodological.* ***Groundbreaking!***
- *I feel this would be a very relevant course to History of Arts students and History of Art and Material Studies student who are interested in Museum studies and reproduction technologies. (…) I learnt so much more of what UCL can offer as an institution. To me it was an overall great experience. Very hands-on.*
- *LOVED THE MUSEUM, PLEASE CAN WE HAVE ALL OF THEM IN THE MUSEUMS. (this is not feasible,but I want the museums)*

A map of Heritage educational opportunities in the UK and in Germany shows offers of study in Heritage, Museology and Digital Heritage educational offers; the map is work in progress and has no claim to completeness (Hess, 2017). Currently most studies related to heritage are located within university faculties of arts, humanities, archaeology, architecture/ built environment and design. The engineering and geomatics departments (not shown on the map) offer remote sensing and reality capture courses.

Please get in touch if you would like to add opportunities for other countries.

Initial Training Nework Cultural Heritage, EU, Ende im Mai 2017 „Final Conference“– Anknüpfungspunkte

The new Masters programme is founded on four different motivations. There is an overall motivation Europewide and worldwide for the digital heritage preservation and documentation through UNESCO.
Then we are going into German and specifically Bavarian funding streams, where the ministry of education has recognised the need to provide funding for digitisation and e-infrastructure and innovative educational programmes, which is called Digital Campus.
Further the Alliance for Technology for the region of Franconia is establishing new cooperative programmes, such as the Bamberg Coburg Connection.

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The understanding of issues in cultural heritage preservation and heritage conservation begins in the education of the future stakeholders and the innovative integration of technologies into the curriculum.

I would like to conclude in asking you to get in touch to talk to me about similar course developments. And if you have suggestions on how to go about the planning and excecution of a new course like the one I introduced.
I am interested to see how a network of new digital heritage technologists is coming out of dedicated degree programs.