



Innovation Resources

End of Project Report

March 2021

PROJECT SUMMARY

Arts University Bournemouth (AUB) is a world-class arts, design, performance and media university. AUB is committed to supporting local growth and regeneration through working with start-ups and Small Medium Enterprises (SMEs) and developing entrepreneurial behaviours and future skills capabilities in our students and graduates.

Over the last four years AUB have invested our own resources and attracted investments from the European Regional Development Agency (ERDF) and the Dorset Local Enterprise Partnership (DLEP) to grow our support for local business. We have worked with over 250 SMEs to develop new skills and prototype and test new products and services.

Through this work with industry partners AUB have identified the need to develop future facing skills in digital design for virtual environments and physical manufacturing. The equipment purchased will strengthen and extend capabilities in strategically important areas including the creative and cultural, and engineering and manufacturing sectors. This will support staff, students, professionals, practitioners and SMEs to enhance their skillbase and create a unique regional facility to enable innovation, research and development in the region.

This project has created an accessible resource of specialist digital equipment that will enhance the technical capabilities of the region. It will provide businesses with remote access to a suite of specialist equipment to upskill staff and enable sustainable and cost-effective rapid prototyping. It will support course creation including post-graduate and part-time CPD which align with future skill needs and specialist skills to aid economic recovery. It will significantly extend the capabilities available to start-up businesses and local SMEs.

The first phase of the project, from September 2020 to March 2021 finalised the range of resources, procuring the equipment and establishing the facility. The first part of the project focussed on cutting-edge manufacturing equipment driven by digital inputs. The second part focussed on Augmented and Mixed Reality equipment to support virtual prototyping, visualisation and projection.

Project start date	30 th September 2020
Project completion date	31 st March 2021

OUTPUTS AND OUTCOMES:

Outputs

The Outputs generated by the project are as follows.

Remote access – AUB invested in technology to enable remote access to specialist resources and equipment. This will enable greater reach; external companies will not have to physically travel to input their files or use equipment. This also gives AUB greater flexibility, allowing activity to continue despite unexpected events such as recent lockdowns.

The items purchased include: licenses for Citrix Netscaler software to enable data sharing and remote control of workstations; a virtual sever to manage and control resource allocation; 'donor' workstations dedicated to running the tasks and cameras to monitor the output of physical manufacturing technology.

Physical manufacture – AUB has invested in physical engineering and manufacturing technology including a range of additive printers and CNC milling machines. For this project

AUB augmented these capabilities with a water-jet cutter. The water-jet can precision cut almost any material, significantly extending AUB's prototyping capabilities. The cutter accepts a variety of digital inputs from a range of design software.

AUB has also purchased a digital loom. Capable of taking input from most graphics programmes, a digital loom supports designers by enabling rapid-prototyping and product development, generating samples on exceptionally short turn-around. The loom supports natural and synthetic fibres as well as some metals. This investment will support the development of technical clothing alongside traditional soft goods.



Figures 1 and 2: Digital loom

Mixed Reality (MR) – AUB have created a facility with a bank of equipment to enable creating products, environments or experiences in virtual or augmented reality, combined with physical computing sensors to enable prototyping and testing of Internet of Things applications. These assets can be grouped under **input**, **visualisation** and **projection** and **physical computing**.

Input: Devices that can be used to take assets into virtual environments for further manipulation. These include; Large Object/Body Scanner, this uses infra-red beams to create a digital avatar of a human body, or other object, accurate to 0.1mm. This avatar can be taken into other programmes e.g. for use in fashion, games or VFX. LIDAR scanners use lasers to measure depth, and this enables it to create accurate maps of the immediate environment, for example, a room or a section of forest. This data can then be taken into other applications and used to create accurate virtual environments. Ultraleap and Stratos Inspire identify a body moving in a space, they can be used to create experiences where the motion of a person or object in physical space triggers actions within the virtual world. The Inspire package includes haptic feedback so events in the virtual world can be physically felt by participants. Go Pro camera kits enable data capture in external environments. Scanners enable the capture of physical objects as images. A green screen and LED lights combine to be able to capture participants actions and import that data into virtual environments.

Visualisation: Headsets and other devices that enable the user to experience virtual or augmented reality or develop virtual experiences. AUB have procured a range of headsets including; Oculus Development Kits, the most widely available headsets, Vive Development kits which are designed for more complex environments and scenarios. The Hololens Development Kit which is the first VR headset to create holographic assets that can blend into the external environment.



Figures 3 and 4: Vive VR headset and peripherals

Projection: Devices that project interactive maps onto the external environment, allowing interaction and experience without the need for headsets. This includes Canon and Epsom short throw interactive projectors and Laseros interactive projector.

Physical Computing: Components to create devices that link digital and physical environments enabling the prototyping and testing of Internet of Things applications. AUB have created a starter resource pack including; multiple Arduino kits including Starter Pack, Internet of Things bundle, CTC 10, multiple sensors, such as RFID or light, moisture, ultrasonics. Raspberry Pi starter and personal computer kits and Bare Conductive electrical paint.



Figure 5: Arduino starter kit

Outcomes:

The intended outcomes of the project are as follows:

OUTCOMES MATRIC – Innovation Resources		Unit	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	Total Projections up to FY 2025
Outcome	Definition		Annual Projections					
Jobs Created/safeguarded	The total number of newly created and safeguarded permanent full-time equivalent jobs as a direct result of the intervention at predetermined employment sites.	FTEs	7	2	2	4	4	20
No. of Job Years (accumulative)	Economic assumption that every job created exists for 3 years only, so GVA benefits are multiplied by this but not beyond.		7	9	11	8	10	45
New Learners Assisted (full qualification)	The number of new learners assisted as a direct result of the intervention, in courses leading to a full qualification.	No.	0	20	23	23	4	70
New Courses Created (PT learners)		No.	0	60	86	106	8	260
New start-ups/business created		No.	0	1	2	3	5	11
Enterprises receiving non-financial support	Number of SMEs receiving support (inc. advice and training) with the intention of improving performance (i.e. reduce costs, increase turnover/profit, innovation, exporting, minimum of 2 days of consulting advice).	No.	4	6	13	13	14	50
Match funding	AUB contribution £45,000 (100% third sector)	£	£23,395	£5266	£5266	£5266	£5266	£45,000
GVA per Job (Dorset LEP area 2018)		£	£48,703	£48,703	£48,703	£48,703	£48,703	£194,812
Annual GVA (assuming job benefit lasts for 3 years)		£	£340,921	£146,109	£292,218	£487,030	£584,436	£1,509,793
Annual GVA (Discounted by 3.5%)		£	£328,988	£140,995	£413,116	£850,777	£1,357,588	£2,762,476
Cumulative GVA (Discounted)		£	£328,988	£140,995	£413,116	£850,777	£1,216,593	£2,762,476
(GVA – from Addendum #1)		£	0	0	0	£93,977	£234,992	£704,975

The aim of the project is to create a resource that will extend AUB's capacity to support upskilling, job creation, talent retention and create new courses & learning opportunities. The table of agreed outcomes are all on track to be delivered over the next five years.

Jobs Created/Safeguarded. the creation of the resource has had an effect on employment at AUB.

AUB have initially created two roles directly as a result of this project:

- *Technician Demonstrator*, specialising in additive manufacturing with an awareness of 3D design.
- *Learning Technologist*, tasked with exploiting creative tech to develop and deliver new capabilities internally and new learning experiences.

The project has safeguarded another five roles:

- *Senior Innovation Technician*
- *Workshop Technician*
- these are specialist roles that will support driving the technology and supporting industry and student access for prototyping, researching and testing. Innovation and Executive Education Manager,
- Open Campus Operations Manager,
- Open Campus Administrator.

This team will develop and manage short courses, upskilling workshops and specialist executive education building programmes around the Resources and the Suite.

Match-Funding. The match funding realised so far is in AUB's contribution to the resources. It does not yet include any salary costs for running the space. We will calculate these based on actuals at the end of the financial year.

Enterprises receiving support. There are 4 businesses that have had access to support sufficient to claim an outcome so far. These include an international fashion house that we are currently unable to disclose in a public forum. An audio company developing a therapeutic product, an events company testing large scale interactive projections and creating artefacts for an experimental arts organisation.

There are a further 4 projects beginning September 2021.

The new curriculum is yet to be launched but several courses are in development aimed at professionals and practitioners based around challenges facing different industries. The first of the new programmes will be launched by September 2021

BENEFITS REALISED TO DATE

The project has enabled bringing in new specialist talent and committing to a strategy to build new courses around the resource and utilising new technology in curriculum development. We have already attracted an internationally significant company to work with us on a collaborative research project.

The ongoing benefits of the project will be felt over the coming years.

FINANCES

AUB delivered three separate projects with Dorset LEP funding, however in order to maximise the benefit there was oversight and coordination between all three. One of the projects involved a procurement process that included several large high value items, some from international suppliers. Due to uncertainty around Brexit there were currency fluctuations between costing, ordering and paying. The budget was closely monitored to ensure that any surplus from the physical manufacturing equipment could be moved into the Mixed Reality Resources where small savings could make a significant difference. Because of this we were able to build a much greater Mixed Reality resource. AUB continues to make its match-funding.

LESSONS LEARNT

The biggest challenge was managing the procurement process within the tight time frame, especially for the larger capital items which required a tender process. The project delivery

team worked proactively with AUB's Procurement Manager and Finance team. Advice was sought from external organisations in other regions who had been successful in developing VR/AR resources i.e., Bristol VR and Pervasive Media Lab at Watershed. The major risks were all external, Brexit, delivery delays, customs charges etc. The project team had to maintain communication with suppliers and bring in expertise such as Customs Agents where necessary.

SUCCESS STORY

The project has been successful in that AUB have created an extraordinary forward-thinking resource. We are installing, deploying, testing as we are making it available to external companies, internal staff and students. We are developing new learning opportunities at all levels; professional CPD, Research, Postgraduate and Undergraduate upskilling alongside collaborative research and community engagement. We are already attracting some big national and international organisations who are interested in working with AUB. This is only the beginning of the project, and our next annual report will have the stories of what we have achieved.

Continued uncertainty over Covid restrictions, as well as adding the finishing touches to the buildings, means we have delayed our big publicity launch. This will now happen in October 2021 but we have soft launched by engaging with individual companies.

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