

STEM Assets in the West Midlands Innovation Landscape

Schwarz, Juliane

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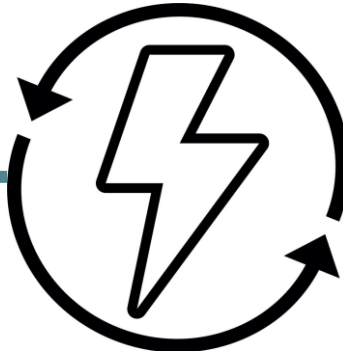
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STEM assets in the West Midlands innovation landscape: STEAMhouse



July
2023

Dr Juliane Schwarz

With special thanks to Professor Joanna Birch, Director of Innovation, Enterprise and Employability at BCU, and STEAMhouse staff for their contributions.

As a region, we are not fully leveraging our intellectual capital, assets and capabilities for economic growth and social development because of a nationally persistent communication gap between university-based R&D and research users, including firms and public sector organisations. This means we are not fully leveraging our intellectual capital, assets and capabilities for economic growth and social development.

The UK is committed to [increasing investment in Research, Development and Innovation to 2.4 percent of GDP](#) (the OECD average) and this will require better alignment between universities and these stakeholders in collaborative innovation efforts to improve our economy and our society.

This policy briefing focuses specifically on a Birmingham City University (BCU) asset (STEAMhouse) and explores its contribution to improving economic performance and social inequality in our region. BCU has invested £4.5M in the new STEAMhouse building, renovating the disused Belmont Works and supporting the re-generation of Birmingham's Eastside.

STEAMhouse aims to find the most innovative solutions to today's challenges by encouraging collaboration of the arts, science, technology, engineering and maths (STEAM) to create innovation and opportunities in the West Midlands.

Introduction

This briefing aims to further understand innovation support by higher education institutions in the West Midlands region. One of the most recent university-led initiatives with a purpose-built physical space is STEAMhouse. Located close to Birmingham City Centre, STEAMhouse is a Birmingham City University (BCU) innovation asset at Birmingham's Eastside in the proximity of two universities and the privately owned Bruntwood Innovation Campus. Its aim is to drive innovation and research in Birmingham and the West Midlands region.

This briefing is based on five interviews with various members of STEAMhouse staff plus publicly available information, such as STEAMhouse website, regional audits, impact studies and news articles. STEAMhouse is one of four case studies our empirical research is focussing on. It aims at building an understanding of the specific regional contribution the fixed asset makes and the factors that constrain innovation, productivity and growth.

Overview

[STEAMhouse](#) is a centre for collaborative innovation at Birmingham City University (BCU). It aims to boost local growth by removing barriers such as cost and equipment access to the development of new products and services, and encourages experimentation. It provides support for businesses of all sizes (from sole traders to large companies) and offers production and prototyping facilities for technologists, artists, designers, scientists and innovators. It defines itself as a 'multi-disciplinary community that drives business growth and overcomes commercial and societal challenges through collaboration and innovation.'

Based on the STEAM framework and central in its development, STEAMhouse aims to spur innovation between the arts, science, technology, engineering and maths. It adds the Arts to STEM and thus enhances knowledge exchange and collaboration to bridge gaps created by institutional and ideological differences in these very diverse subjects.

STEAMhouse was established in partnership with Birmingham City University and [Eastside Projects](#), a Birmingham-based arts organisation. The development of the concept started in 2014 to improve the overarching innovation infrastructure in Birmingham and the West Midlands by involving the creative sector in innovation and business development.

The [UK Innovation Survey 2013](#), placed the West Midlands 6th of 9 regions in terms of the percentage of innovation-active businesses and the Higher Education Funding Council for England reported that the Greater Birmingham and Solihull Local Enterprise Partnership (GBSLEP) area was performing below the national average in terms of SMEs involved in collaborative innovation. A lack of infrastructure (production spaces and maker spaces) prevented creatives to get involved in investment processes that have been available for STEM-based innovation. The [GBSLEP](#) made a strong case in its Strategy for Growth to invest in STEAM skills to strengthen the innovative capabilities of the region. In its pilot phase or Phase I, the project secure more than £3 Mio funding from the ERDF and Arts Council through the Creative Local Growth Fund (CLGF) by 2020. In phase II, investments of £72 million, including £15 million in grant funding, went into the renovation and development of the disused Belmont Works and the creation of a new linked building for STEAMhouse.

Between [2017 and 2020](#), STEAMhouse was located in the former South and City College building in Digbeth High Street where it was officially launched in 2018.

Overview (continued)

The building (demolished now) hosted 15,000 sq feet of co-working spaces, project spaces and a new makerspace (the Production Space) equipped with 3D printers, laser cutting machinery, virtual reality technology and printing studios.

Technicians support creative entrepreneurs and start-ups, including self-employed, sole trading artists, designers and makers, in the production and prototyping in digital, wood, metal and print free of cost. It ran a programme focussed to deliver new products and services (artwork, art projects and creative services) and explored how collaboration across sectors and disciplines could help create innovation and relationships. STEAMhouse also provides a venue for workshops, networking events, and other business support services.

In early 2022, STEAMhouse moved into new facilities. The redeveloped Belmont Works Building is located at the Birmingham City University in the Birmingham Knowledge Quarter closed to Aston University and Bruntwood innovation campus. With 100,000 sq feet, it hosts office space and business support activities for small to mid-sized enterprises and larger businesses and organisations.

The five floors contain production spaces for prototyping in print, materials (wood, metal, plastic), digital design, digital manufacture, Augmented (AR) and Virtual Reality (VR) supported by five STEAMhouse technicians; the STEAMhouse business incubator and Digital Innovation Hub, offices for start-ups, small and medium size to larger businesses and teaching, training and innovation spaces.

STEAMhouse Phase 1 Outputs



15,000 sq foot
facilities

257

Enterprises
supported

65

New enterprise
supported



73

New products
created

34 new
research
collaborations



6,500
hours support

19 new market
product created

£50k

Grants to
SMEs



30 enterprises
employed
graduates

In Phase 1 (2018-2022), STEAMhouse secured more than £3 Mio of funding from the ERDF and Arts Council through the Creative Local Growth Fund (CLGF) by 2020.

Funding Profile	Total £
CLGF award	500,000
ERDF/ESF	1,764,001
Other cash funding	1,250,383
Total	3,514,384

Source: [Creative Local Growth Fund: Evaluation \(2020\)](#)

Phase 2 of STEAMhouse, saw an investment of nearly £60 Million of Capital funding by BCU and public funding for the renovation of the disused Belmont Works and the creation of a new linked building. Greater Birmingham and Solihull Local Enterprise Partnership (GBSLEP) has helped fund the project through £1 million of Local Growth Funding and £2.4 million in Enterprise Zone funding. £14 million from the Department for Business Energy and Industrial Strategy, also managed by the GBSLEP, has been invested in the project.

Funding Profile	2019/20	2020/21	Future Years	Total
Capital (LGF)	£1,000,000	-	-	£1,000,000
Capital (EZ)	-	£2,454,000	-	£2,454,000
Capital (BEIS S31)	£11,633,285	£3,366,715	-	£14,000,000
Capital (BCU)	£1,520,754	£16,811,000	£22,113,246	£40,445,000
Total	£13,154,039	£22,631,715	£22,113,246	£57,899,000

Source: [Greater Birmingham and Solihull Local Enterprise Partnership, Supervisory Board 17.07.2020](#)

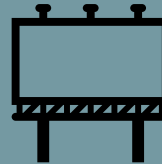
STEAMhouse CREATE Programme Outputs (2015-2023)



110,000 sq foot new purpose-built facilities



New business incubation space



New challenge lab (service design and challenge events)



New co-working facilities

800

Community Members

75

New businesses support

300

New product to market/firms

63

Research Collaborations

Facilities – development and functionality

2017
STEAMhouse
business case
submitted

STEAMhouse was launched by BCU and Eastside Projects in their first venue in Digbeth High Street. In the new £5 Million co-working facility, it enables small companies and artists to work together on new projects and business ideas. In eight rooms equipped with specialist technology and dedicated technicians, entrepreneurs can access 3D printers, laser cutting machinery, virtual reality technology and printing studios for free.

2019
STEAMhouse
Phase 1.5

STEAMhouse project moved to its permanent home, at Belmont Works which was renovated with an investment of around £60 million, including £15 million in grant funding. The building provides a larger-scale collaborative centre, better facilities and additional space to facilitate a greater number and variety of businesses. It is shared with the BCU School of Computer Science and is located close to BCU and its academics and researchers.

Submission of a business case to Greater Birmingham and Solihull Local Enterprise Partnership (GBSLEP) by Birmingham City University (BCU) for the redevelopment and extension of Belmont Works, a partially listed building on a plot within Eastside Locks, to create the STEAMhouse.

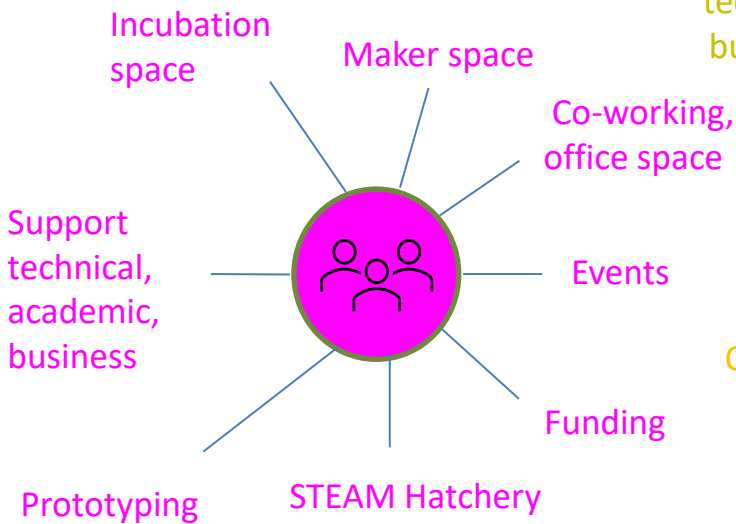
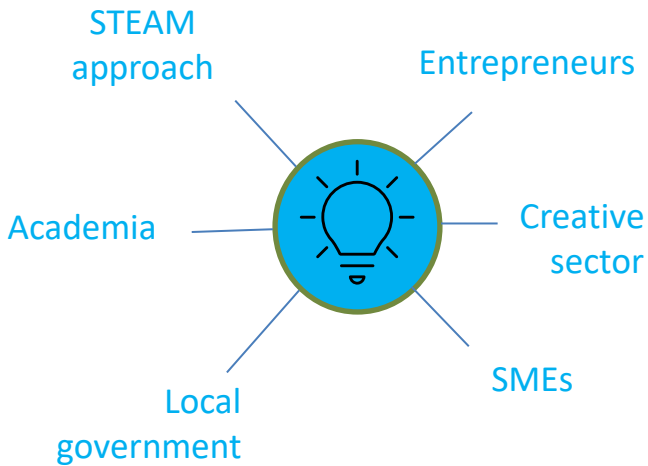
2018
STEAMhouse
Phase 1
Digbeth High
Street

Addition of a virtual reality space and Computer Aided Design (CAD) suite with a greater focus on digital enabling technologies to increase STEAMhouse's capability to accelerate product design.

2022
STEAMhouse
Phase 2
Belmont Works

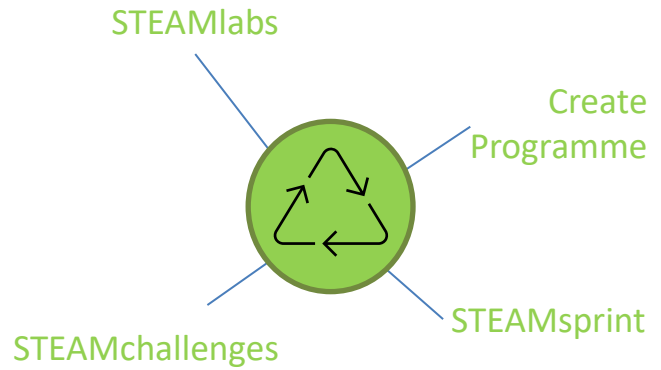
Capabilities and activities

Collaboration

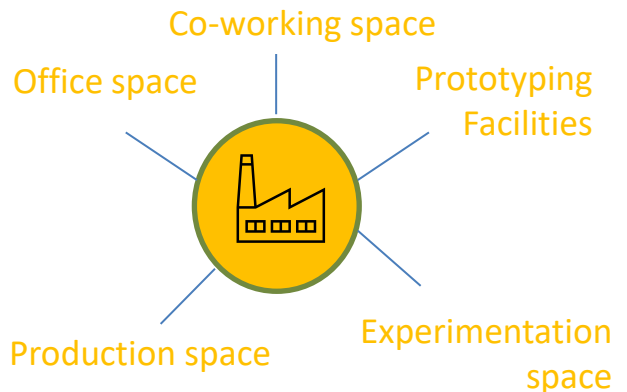
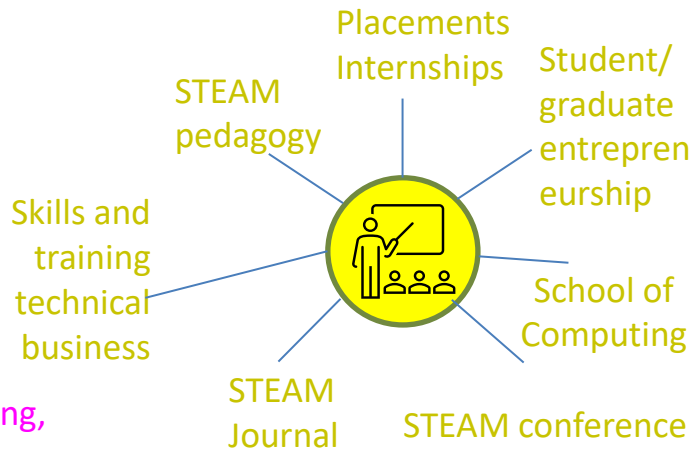


Incubation and facilitation

Innovation



Education



Demonstration and accommodation

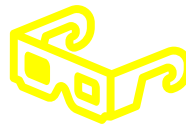
Capabilities – technical capacities and competencies



3D printer



Laser cutting machinery



Virtual reality technology



Printing studios



Digital prototyping and production



Wood prototyping and production



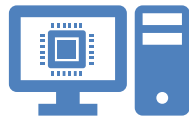
Metal prototyping and production



Print



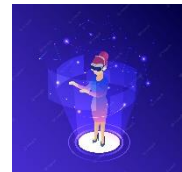
Digital design



Digital manufacture



Augmented (AR)



Virtual Reality (VR)

Impact

Due to its approach to innovation through collaboration between STEM subjects and the arts, STEAMhouse has attracted some substantial funding (including the European Union). STEAMhouse Phase 1 is featured at [Interreg Europe](#) as an example for good practice of inspiring and tested policy solutions.

It is also discussed in reports discussing it as a model of innovative thinking and approaches. For example, in the [State of the Relationship](#) report (2019) compiled by the National Centre for Universities and Businesses, STEAMhouse features as a case study with particular emphasis on STEAMlabs where individuals address challenges faced by society in a two-day hack-style event.

In the process of approving its business case, it was projected that the STEAMhouse, including the Belmont Work, will generate an overall benefit-cost ratio of 3.4. and as such it was evaluated to demonstrate a high value for money. There have been, however, few publicly available independent impact assessments of STEAMhouse conducted since its inception.

STEAMhouse is cited as a [centre of excellence](#) and one of the major instruments to support the West Midlands Combined Authority (WMCA) [placed based R&D and innovation strategy](#).

The Arts Council England published an [Evaluation of the Creative Local Growth Fund](#) (CLGF) in 2020. STEAMhouse is one of nine CLGF-funded projects that received altogether £18.3 Million in cash funding. The evaluation concluded that on an aggregate basis across eight of the nine CLGF projects:

- * The programme outperformed all of its targets for the ERDF and ESF.
- * All CLGF led directly to new local partnerships or deeply strengthened existing ones in particular with Higher Education Institutions.
- * CLGF projects achieved a high degree of funding leverage, going beyond the cash funding obtained from ERDF/ESF.

- * The availability and access to physical space are highly beneficial for artists.
- * As are training, skills and the development of confidence and resilience.
- * However, CLGF seems not to have a significant impact on the LEPs' perception of arts and culture within the economic growth agenda, mainly remaining or reinforcing the arts and culture sector in areas where it is seen as an important sector.
- And, despite the strong performance of its original objectives, the costs of achieving these were relatively high and the economic value of CLGF was short of the resources invested.¹

Oxford Economics, in their review of the [socio-economic impact of Birmingham City University](#) (BCU) and looking at 2017/18 data, concludes that BCU 'makes a substantial contribution to the prosperity and culture of Birmingham, the West Midlands, and the United Kingdom as a whole' and they conclude many of these are long-term impacts which will carry benefits to the region for years to come.'

STEAMhouse features strongly in terms of how it fosters innovation across Birmingham and the wider West Midlands economy. It is commented that after 12 months of operation in 2018, STEAMhouse had 249 registered members, received over a thousand visitors a month, and helped create 45 new products and services. STEAMhouse Phase 1 has delivered a valuable and well-utilised service to local innovation and product development, there was a scope to expand its offering and thus STEAMhouse Phase 1.5 was developed with a focus on digital enabling technology by adding a virtual reality space and Computer Aided Design (CAD).

¹ The authors emphasise:

*that the position that standard metrics of growth such as employment do not perfectly suit the cultural and creative sector.

*that the GVA forecast for 2024 might equal 152% of the value of the inputs to the programme.

*that GVA only captures monetizable and quantifiable benefits but not wider positive effects such as well-being and other social impacts.

Interview partners

Organisation	Role
BCU	Head of Innovation and STEAMhouse
BCU, Eastside Project	Creative Director STEAMhouse, Founding Director of Eastside Projects
BCU	Programme Manager, responsible for overall project delivery of STEAMhouse
BCU	Head of Growth and Incubation - STEAMhouse, responsible for the management of start up and SME businesses in the new STEAMhouse Belmont Works
BCU	Head of Service Innovation and Experimentation at Birmingham City University (BCU)'s STEAMhouse

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- Birmingham City University [STEAMhouse website](#) (accessed July 2022)
- * Columbano A. (2022) Pedagogy and Production Space. In: Sanderson L. and Stone S. (eds.) Emerging Practices in Architectural Pedagogy Accommodating an Uncertain Future. Routledge.
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- * National Centre for Universities and Businesses (2019) [State of the Relationship](#).
- * Oxford Economics (June 2020) [Birmingham City University's Socio-Economic impact](#).
- * West Midlands Combined Authority (January 2023) [West Midlands' Circular Economy Roadmap](#).
- * West Midlands Combined Authority (June 2020) [State of the Region Report 2020](#).

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Details of the author:

- Juliane Schwarz, Research Fellow at City-REDI and can be contacted at

j.schwarz@bham.ac.uk

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