Institution: University of Greenwich

Unit of Assessment: 32 - Art and Design: History, Practice and Theory

Title of case study: SMASHfestUK: A new public engagement model enhancing equality, diversity and inclusion for young people, communities and the public at large

Period when the underpinning research was undertaken: October 2015 - December 2020

Details of staff conducting the underpinning research from the submitting unit:

Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Dr Lindsay Keith	Creative Research Fellow	05/10/2015 - present

Period when the claimed impact occurred: October 2015 - December 2020

Is this case study continued from a case study submitted in 2014? N

1. Summary of the impact

SMASHfestUK is a multidisciplinary research collaboration between the University of Greenwich and the Middlesex University, which embeds art and science research into inclusive public engagement. The programme of events (2015 – 2020) employed SCENE, a novel, research-led model, to attract a majority Black and other ethnic minority audience, as well as those facing socio-economic challenges. The research reached more than 80,000 people, raised young people's aspirations and increased their 'science capital'. The SCENE model is embedded into the social enterprise, SMASH-UK, which has employed more than 100 people since 2018. Evidence from SMASHfestUK has influenced creative practice, UK funder's engagement strategies and informed public engagement policy at a national level.

2. Underpinning research

Science, technology, engineering and mathematics (STEM) study choices and careers in the UK are dominated by White males, with women and Black, Black-Heritage and other ethnic minorities under-represented. The same groups are under-represented in audiences at informal science learning (ISL) venues and activities. In 2013, the "Aspires" study showed that some demographic groups (Black, Black Heritage and other ethnic minorities and White working-class) did not aspire to STEM study or careers and established the concept of "science capital" (SC), defined as the sum of all the science-related knowledge, attitudes, experiences, and resources that individuals accumulate. Families discussing science, exposure to scientists, and ISL experiences (i.e., science museums or festival visits) can raise SC. SMASHfestUK was created to boost SC by bringing the "science museum experience" to locales in which the major demographics would include people who are currently underrepresented as visitors to arts, science and culture centres **[R1]**.

In 2015, **Dr Lindsay Keith** and Wyn Griffiths (Middlesex University) piloted "SMASHfestUK" as a participatory action research (PAR) project. **Keith's** research combined experiential storytelling into mainstream audience engagement methods with pedagogical approaches for successful engagement and outcomes with ISL. This was combined with a human interaction 'Co-design-lead' approach employed by Griffiths. To ensure an effective and inclusive public engagement model, they established mechanisms for overcoming barriers to access that existed for under-served and under-represented audiences, as well as female visitors **[R1]**.

SCENE: An inclusive engagement model

Keith and Griffiths developed a Co-design-lead process resulting in a novel model for audience engagement. Using PAR methodologies, the model was prototyped, tested and developed throughout four major Festival iterations, (with additional sub-cycles within those iterations), resulting in the final model, 'SCENE'**.** The key principles that ensure audience inclusivity within

SCENE are a) application to **S**TEAM subjects, b) use of **C**ommunity co-design, c) contextual **E**nquiry, d) **N**arrative storytelling, e) focus on **E**ntertainment. Independent evaluations have shown that SCENE and personalisation of events as 'local' and 'for me' promotes intergenerational learning which also raises SC **[R1-2]**.

The model employed immersion and embodiment of visitors/audience as 'actors with agency' within a disaster-based narrative in which an impending natural disaster threatens local and world security. The disaster narratives were 'Asteroid!' (2015), 'Solar Storm!' (2016), 'Super volcano!' (2017) and 'Flood!' (2018). The team tested the SCENE model through iterations of the festival. Methods for using ISL to increase SC in visitors were also developed, and mechanisms for testing their success in doing so incorporated into the festival design. The pilot SMASHfestUK event was designed to initiate the establishment of an evidence-base for developing a set of principles geared to enhancing inclusiveness in public engagement activities. With each annual iteration of the event, these principles have been independently evaluated as to how they influence and optimise access to Black, Black Heritage and other ethnic minorities, White working-class and female audiences, as well as to how they build SC in these audiences. In addition to the festival, the team used school and stakeholder workshops as focus groups to generate further insights to inform the same model **[R1-2]**.

3. References to the research

Research Outputs:

R1 **Keith, L.** (2015 – 2020) Multi-component research portfolio output, *SMASHfestUK 2015 – 2020: A participatory action research programme resulting in the development of a novel model "SCENE" for inclusive public engagement with research.* http://gala.gre.ac.uk/id/eprint/31939/ ***[REF2 Submission – Identifier 26720]***

R2 **Keith, L.** and Griffiths,W. (2020). *'"Space Plague": an investigation into immersive theatre and narrative transportation effects in informal pandemic science education'*. JCOM 19 (07), N01. https://doi.org/10.22323/2.19070801 ***[REF2 Submission - Identifier 30696]***

Grant Funding (2015 - 2020):

G1 The Wellcome Trust People Award: PI **Lindsay Keith**, '*SMASHfestUK 2016 - Solar Storm: A returning science and arts mash-up festival for Deptford, London*.' £39,900 (Nov 2015 – June 2016)

G2 Royal Academy of Engineering INGENIOUS Award: Joint lead applicant **Lindsay Keith** *'Survival Village @SMASHfestUK: a festival bringing engineering to new audiences'* £29,878 (Jul 2016 – Jul 2017)

G3 Arts Council England: PI **Lindsay Keith** *'SMASHfestUK 2017: 'SUPERVOLCANO!'* £15,000 (Dec 2016 – May 2017)

G4 The Wellcome Trust People Award: PI **Lindsay Keith** '*SMASHfestUK: 2018/19'* Value £60,000 (Oct 2017 – Jul 2018)

G5 Arts Council England: PI **Lindsay Keith** *'SMASHfestUK 2018: FLOOD!'* £14,985 (Jan 2018 – Mar 2018)

G6 Royal Academy of Engineering INGENIOUS Award: Joint lead applicant **Lindsay Keith** '*Space Plague Immersive Engineering Experience'* £28,930 (May 2019 – May 2020)

G7 STFC Research Grant, Nucleus Awards Co-I **Lindsay Keith** *'Space Plague: An immersive, collaborative and scaleable experience providing deep engagement with the physical sciences for young people and families'* £124,617 (Jun 2019 – Dec21; extended to Jun 2021 due to COVID).

4. Details of the impact

People living with socio-economic deprivation in the UK (which often intersects with ethnic minority communities) have restricted access to STEM informal science learning (ISL) which can prevent

young people from these socio-demographic groups pursuing STEM options at school and beyond. These groups have lower science capital (SC) indicators than those living in wealthier areas. **Keith** and Griffiths established mechanisms for overcoming barriers to access through their PAR project, 'SMASHfestUK' which has engaged new and under-served audiences with ISL and has reached demographic groups that other science festivals struggle to engage. Furthermore, it has raised awareness, enhanced understanding, and most importantly, changed audience attitudes toward STEM subjects. This has led to enhanced science capital (SC) for visitors. Their 'SCENE' model is now used as a best practice guide for reaching previously under-served audiences. It has also enabled public and private sector organisations in the UK to improve their policies for, and approaches to, inclusive public engagement.

Increased participation of under-served audiences in ISL raising science capital

University of Greenwich (UoG) research (2015 – 2020), led by **Keith**, has transformed the demographic of science festival audiences **[E1** p36,64,65,136,137**]**. The pilot event (2015) attracted more than 800 visitors, primarily from the lowest-quintile economic regions of Southeast London **[E1** p31**].** The SMASHfestUK attendance has grown by more than 25% each returning year, and the 2018 festival attracted at least 3,526 visitors **[E1** p126**]**. Overall, it has reached more than 80,000 people across England through school and community programmes for disadvantaged people **[E1, R1]**, plus a further 100,000 people internationally through online engagement and broadcast activities, including an international audience of 59,000 for a Guinness World record attempt to create an exploding cryovolcano **[E1 p57]**. In 2016, more than 70% of SMASHfestUK visitors under 16-years old (U16) were Black, Black Heritage and other ethnic minorities, and/or White working-class. In addition, U16 females attending SMASHfestUK events exceeded U16 males 59:41 **[E1** p36,37,38**]**. The significance of this ground-breaking achievement was evidenced by a British Science Association report which demonstrated that typical UK science festival attendees in the UK are dominated by primarily middle-class White males and people already engaged with science. By contrast, the 2018 British Science Festival attracted a Black, Asian and ethnic minority audience of just 11%. Most attendees (71%) of the respondents to the 2017 evaluation had not visited an event similar to SMASHfestUK before and only 15% of SMASHfestUK visitors reported a prior interest in science or arts **[E1** p67**]**. This indicated that, for many, SMASHfestUK represents a unique and wholly different experience for them. After the 2018 festival, 88% of visitors reported they had learnt something new, and 94% reported that SMASHfestUK had improved their understanding of the role of science in everyday life - a key indicator of science capital **[E1** p144**, R1]**.

Increasing young people's science capital

SMASHfestUK used immersive and interactive activities to engage younger people with STEM by using imminent natural disaster scenarios and STEM-led strategies for survival and rebuilding in the aftermath. In 2017, 82% said the event had made them more excited about STEM subjects and 76% agreed or strongly agreed that the event had given them a positive attitude to studying STEM (at school) **[E1** p94**]**.

The SMASHfestUK project and SCENE model **[R1]** partnered with ten schools in the Deptford area, reaching over 10,000 Key Stage 2 children through workshops, interactive assemblies, and materials (e.g., 3,276 pupils reached in 2017) **[E1** p104**]**. These workshops are a critical element of the co-design process and their research findings were incorporated into SMASHfestUK, giving local schoolchildren ownership of the event. The immersive workshops advanced the pupil's understanding and awareness of STEM and increased aspirations **[E2]**. Katherine Sladden, Assistant Principal, Haberdashers Askes Temple Grove Free School said: *"It helped to raise the profile of science within the school, enhanced our science teaching practice and expanded our knowledge of informal science learning methodologies. This has boosted the pupil's enthusiasm for science, raised their aspirations and increased their science capital."* **[E2]**

The project also recruits young people from local schools, colleges and youth groups and provides them with the skills to become 'Young Explainers' (YE). After a successful 2016 pilot, in 2017/18, SMASHfestUK recruited 91 YEs who were trained in public engagement and safeguarding and put their new skills into practice by delivering high-quality public engagement for SMASHfestUK.

This led to many Black, Asian and minority ethnic young people proceeding to study STEM subjects at university who may not have previously chosen this path. One YE said: *"Seeing what other people do was mind-blowing. I'd never actually met people who work in such scientific fields or pursue academic careers. It was so positive and made me think – 'if they can do it - why can't I do it too?'. It's convinced me about a career in science."* **[E1** p42**]**.

Two YEs who were recruited from the LPF Kiddies Club (LPFKC, which is a non-profit, Greenwich-based, out-of-school science club, working with approximately 45 African and Caribbean children aged 5 to 14 years and their families) are now studying science at degree level. The volunteering experience enabled the YEs to develop many skills which have supported them with their future science career path. Carmel Britto, Founder, CEO and Education Director, LPFKC said: "*The skills and experience they learnt had a positive impact upon their choice to pursue Science pathways into further education...."* LPFKC also took groups of their children to the festivals and this helped to raise their aspirations and enabled them to start to connect different career paths with studying science. "*[SMASHfestUK] helped us deliver our aim to develop and enhance the potential, skills, and talents of the young children we work with. [SMASHfestUK] has enhanced their knowledge, skills and social capital which enabled them to raise their aspiration levels."* **[E3]**

Contribution to innovation and entrepreneurial activity

SMASHfestUK has resulted in the creation of IP and new products which have been exploited both commercially and for cultural enrichment. This includes multiple films and videos and 11 original theatrical productions, including three novel full-length professional plays both traditional and immersive. SMASHfestUK also provides training to upskill organisations in creating theatrical immersive engagement narratives. Following training, the British Ecological Society (BES) integrated the **[R1]** SCENE model into workshops for 120 pupils and teachers, and the Deptford 2020 SMASHfestUK "Space Plague" programme. Chris Jeffs, BES Senior Education and Engagement Officer said: *"This event represented the first instance of BES using narrative-led theatrical immersive engagement in its public engagement programme".* This also led them to create workshops which they delivered to 120 pupils and teachers **[E4]**.

As a direct result of the Centre for Medicines Discovery (CMD) collaboration with UoG research **[R1]**, CMD volunteer enthusiasm and participation in public engagement activities increased significantly compared to previous years. Dr Eleanor Williams, Public Engagement Officer, CMD said*, "researchers were very keen to volunteer for the SMASHfestUK collaboration and it captured their imaginations and enthusiasm for participating in a way that we had not previously seen in the department".* Another outcome of the collaboration was that "*the CMD secured a GBP10,000 grant from Wellcome as part of their 'enriching engagement' scheme.''* **[E5]**.

SMASHfestUK has led to the empowerment of local businesses, communities and individuals. In December 2018, it launched an independent social-enterprise community interest company (SMASH-UK CIC), which has employed more than 100 people. Six apprentices and interns progressed to careers in the creative and/or engineering industries. Esther Lie, Science Gallery, London said: *"The skills I have gained working with SMASHfestUK have distinctly helped my career. It was instrumental in me securing my position at Science Gallery London, King's College London as a Community Engagement Manager…. My creative practice has been improved at the Science Gallery through the innovative methods I have used to engage communities which were based on SMASHfestUK's [PAR] research."* **[E6]**.

Influencing UK policy and funders' strategies

Keith's expertise has contributed to changes at a national policy level and her work with funders has resulted in changes to their engagement strategies. Working on a round table with Engineering UK, BP, Shell, RAE and DfE, she was instrumental in the production of a Code of Practice for inclusive engineering engagement, entitled "Tomorrow's Engineers" (October 2020) which has now been signed by over 120+ organisations. Gareth Thistleton, Head of Social Investment, Shell UK said, *"your input… has been hugely valuable to the co-creation process for the Tomorrow's Engineers Code… your support, insights and challenges created lasting benefit for current and future Signatories of The Code."* **[E7]**

BES changed its public engagement practice due to learning from its involvement with SMASHfest-UK. It fed into the creation of the BES' first 'Public Engagement Strategic Aims' document which was developed during 2020 **[E4]**. It also *"enabled a justification to increase [our] annual focus on projects utilising high quality immersive engagement experiences with publics rather than [our] past focus on mass reach lower quality engagement experiences"*. Chris Jeffs, Senior Education & Engagement Officer, BES **[E4]**.

The Science and Technology Facilities Council (STFC) directly attributed their new community-based engagement initiative, "Wonder" to the results of **[R1]**. Derek Gillespie, Head of Skills and Engagement, Science and Technology Facilities Council (STFC) said: *"Delivery mechanisms and evaluation thinking for our 'Wonder' initiative to reach under-served audiences has been directly influenced by the contributions of the SMASHfest team."* In addition, **Keith's** research improved STFC's 2016-2021 engagement strategy. *"…with the SMASHfest team, the development and delivery of STFC's engagement strategy has been demonstrably improved."* **[E8]**

5. Sources to corroborate the impact

1. Independent evaluations: SMASHfest 2015 (Flow Global April 2015), SMASHfest 2016 (SAM-Culture Feb 2016) and SMASHfest 2017 and SMASHfest 2018 (Dr Natasha Simons)
2. Testimonial: Katherine Sladden, Headteacher, Haberdashers Askes Temple Grove Free School testimonial
3. Testimonial: Carmel Britto, LPF Kiddies Club, Founder and CEO,
4. Testimonial: Chris Jeffs, Senior Education and Engagement Officer, British Ecological Society
5. Testimonial Dr Eleanor Williams, Public Engagement Officer, Centre for Medicines Discovery
6. Testimonial: Esther Lie, Science Gallery London
7. Testimonial: Tomorrow's Engineers Code of Conduct, Gareth Thistleton, Head of Social Investment, Shell UK
8. Testimonial: Derek Gillespie, Head of Skills and Engagement, Science and Technology Facilities Council (STFC)