SMASHfestUK: A festival, a big story... an ADVENTURE!

Our mission: "A world in which everyone holds the power to employ science & creativity for the good of humanity"

Introduction

SMASHfestUK, a brand new festival mashing up science and the arts, and with an explicit mission to increase diversity and widen participation in STEM and the Arts was founded in Deptford, South East London in 2015. Following the development of a methodology coined NIDSM (Narrative and Inquiry Driven Smashfest Model), SMASHfestUK was developed with the purpose of identifying barriers to access for informal science education and access to and participation in the wider Arts for so called "hard to reach" audiences, including young black and minority ethnic (BME) people also (and including) young people in socio-economically deprived communities.

Background:
The rationale for SMASHfestUK

SMASHfest UK tackles an important and critical issue in an imaginative and engaging way. Its goal is to stimulate the interest of young people in Science, Technology, Engineering and Maths (STEM). This is a pressing issue as interest and achievement in STEM topics in schools is declining, leading to low entry levels to STEM tertiary studies and careers and an imbalance in the supply and demand for qualified STEM professionals . The implications are serious: science and research are major contributors to the UK's prosperity. For the UK's economy to prosper, high levels of skills in science, technology, engineering and maths (STEM) are needed, with citizens that are interested and aware of the importance of these subjects.
SMASHfestUK is rooted in the conviction that making STEM real and fun for young people will open up possibilities that will empower their futures. The Festival provides new opportunities to introduce STEM subjects to young people aged 7 to 17 through inspiring, innovative and interactive arts experiences that appeal to their imaginations, stimulate interest and embed learning. The Festival strategically targeted those who are under-represented in STEM, including economically disadvantaged young people and BAME communities, women and girls, and young people living in poverty.

"Science, technology, engineering and maths (STEM) are enabling. They enable people to make sense of the world around them, they enable people to make informed decisions, and they enable people to pursue a wealth of exciting and fruitful career opportunities... For young people from relatively low socioeconomic status (SES) backgrounds in particular, STEM subjects can be invaluable. They can provide a means by which these young people can better engage with the modern world and take advantage of the opportunities it affords."

Enthusing young people is especially important because 'careers from STEM are not popular aspirations for students age 10 -14 and pupils from age 10 start to self-identify as 'not STEM'. Teachers often have lower (stereotypical) expectations of under-represented groups in STEM.' Several reports suggest that more must be done at school-age level, to redress the imbalance in STEM degrees/careers, and to sustain the STEM workforce.

"The accepted response to these facts is that female, black and minority ethnic and disadvantaged young people are underrepresented in STEM study and the STEM workplace and that, if only we can enthuse / inspire / encourage these particular groups to enter STEM fields, then the skills shortfall will disappear."

AIMS: The aims of SMASHfestUK were several-fold:

·Produce an immersive science/arts festival with a strong narrative theme, engaging hard-to-reach audiences in STEM.
·Research and reduce access barriers with hyperlocal approach and engage 100 young people as facilitators/ambassadors.
·Deepen relationship with Deptford audience nurtured in SMASHfestUK 2015.
·Build community of science communicators/scientists/performers/audience members initiated in SMASHfestUK 2015.
·Grow relationships with scientific/cultural institutions already partnered with to bring them to local communities.
·Increase the science capital and cultural capital of young people in Deptford/Lewisham

"Both scientific research & science fiction begin with the same two words: 'What if?'" Professor James Kakalios, University of Minnesota

Method:

SMASHfestUK was designed to take into account findings from the Aspires Study, The Warwick Report and other important studies which have looked at widening participation and increasing diversity in STEM and the Arts. The vision to create a festival with WPID as its overall aims went along with the development of a model for delivery of STEM and Arts education in an informal setting taking into account specifically "designed-in" elements explicitly aimed at over-coming barriers to engagement identified by previous research. Barriers to access to informal science education were often attitudinal "its not for me," but also geographical – it would take a resident of Deptford over an hour to reach the Science or Natural History Museums in S. uoth Kensington, and many informal science education opportunities such as festivals are not always free to attend, so for low income families, cost is another barrier. The proposals adopted to overcome these barriers were to make the festival free at the point of access. Indeed there is no recourse, even to merchandise, such is the desire to make SMASHfestUK open and fair for everyone to attend. We also planned a participatory design approach to the festival and events contained within it and a schools outreach programme which would helo to further the SMASHfestUK story and build an advance audience and inform our intended audience of the event. Unique to SMASHfestUK and central to model was the element of "hyperlocality"; Deptford's population are considered an underserved and under-represented demographic in STEM/Arts (BME, poverty) sometimes described as "hard to reach" (although the authors consider this term suggests that responsibility for being "hard to reach" falls to the underserved communities, and therefore do not use it). Barriers to access also include the gran edifices of national institutions such as museums, or, indeed, universities. As such it was decided that SMASHfestUK must be held in locations embedded within the local community, that members of that community already used. In the case of Deptford, there were 2 obvious choices: The Deptford Lounge, a community library space well-used by local residents, and the Albany Theatre – a modern open-plan community space which is home to offices of multiple community groups and has an all-day café which serves the local community. For the days of the festival SMASHfestUK took-over all of the spaces in the theatre and lounge, including the garden.

Festival

The festival ran for 7 days in the Deptford Lounge and 3 days in both the Deptford Lounge and the Albany Theatre. There were 35 unique events over these 2 locations, many of which were performances, for example of a play commissioned by SMASHfestUK called Cosmic Jives, which were repeated several times in the programme. Including repeat performances, there were around 70 events in total. In the Deptford Lounge, artist Jenny Edbrooke carried out participatory community artworks including the creation of a large space mural in collaboration with graffiti artist Luke Brabants. It was also home to the SMASHfestUK 'DIY planetarium – a geodesic dome built from plumbing pipe and a second hand mirror for £100. There was an interactive mechanical robot installation featuring pre-digital versions of mobile phone functions, such as a zoetrope instead of a camera and semaphore flags for text messages, and an exhibition on Solar Storms (courtesy of the Royal Observatory Greenwich). In addition the Deptford Lounge hosted Solar Storm Storytelling, the Solar Storm Film Club, and Code Club workshops. In the 3 days that SMASHfestUK was in the Albany Theatre, we added to these events; Upon entering, visitors were invited to build DNA models out of sweets, using different shaped jelly sweets to show howUV radiation can cause mutations (incorrectly linked basepairs) and the Solar Flare game, in which correctly answered questions about sun-safety and radiation were rewarded with UV-inked rubber stamps. Two giant mutant 'fruitflies' also greeted guests alongside a scientist to discuss how fruitflies can be used in genetics research. In the open plan café area we also had 'The Amazing Scene Machine', an participatory clay-modelling event with Aardman animator Jim Parkyn, Poetry Takeaway, and Building Maths Structures. Outside in the garden was the Survival Village, featuring den-building, generating energy from bicycles, make your own battery, solar car racing, the Glow-Bar for non electrical illuminations. Inside the theatre we had a VR journey to the sun, the "Mutation Generation Unit"(turning UV mutations into real-life (prosthetic) mutaqtions), "Wearing my Thermals" an interactive game of hide and seek using thermal imaging cameras and a full programme of performances in 3 performance spaces including the large auditorium and two more intimate studio spaces. Performances included science-variety shows, our specially commissioned play, Cosmic Jives, science themed 'Comedy Club 4 Kids', Simon Watt doing a variety of shows and workshops including 'Dr De-Ath and his Medieval Medicine' and the 'Ugly Animal Show', amongst others.

All faciliators were briefed to embed the activity they were working on within the context of the overall Solar Storm narrative. The suggestion that having this narrative helped to embed and contextualize learning was borne out by feedback we receieved.

- 35 unique events in the Festival programme: increase from 27 in 2015
- 1048 attenders for ticketed shows; 850 through Deptford Lounge activities
- Increase in SMASHfestUK social media: 70 Tweets; 36.9K Tweet impressions; 808 Twitter followers (up from 600), top tweet earned 2,379 impressions;
82 new followers with top interests of Science News and Technology.
- 94 artists and creatives involved including writers, artists, performers, poets, musicians, digital producers and filmmakers
- 40 scientists involved including an epigeneticist, a space physicist and a Professor of Mathematics
- 64 collaborations (including Greenwich Student films & MDX Student installations) emerge as a result - new artworks, presentations, and performance
- 20 young people volunteered as Young Science Explainers
- SMASHfestUK Community Audience Development Programme (CADP) ran year round, developing new connections
- SMASHfestUK established and consolidated innovative partnerships with major cultural and scientific institutions including Wellcome Trust, Middlesex University, Arts Council England, Royal Society of Chemistry, Science and Technology Facilities Council, The Refinery, University of Greenwich, Royal Observatory, Lewisham Council, Telegraph Hill Festival
- Relationships with arts and cultural organisations grew successfully including The Albany, Deptford Lounge, Fun Palaces, National Maritime Museum, Besson Street Community Garden, Mind's Eye and local youth theatre - GLYPT and The Midi Music Company
- Local partnerships are extended - including Lewisham Education Arts Network (LEAN), The Mayor's Office, The Young Mayor's Office and the Lewisham Pupils Ambassadors Scheme.
- Schools enrichment programme (SEP) delivers 9 education events and outreach projects involving over 2924 schoolchildren
- Relationships with local businesses (L&Q Housing, CIS Security) are brokered and new sponsors Vound PLC invest in the Festival
- A new governance format: an independent not for profit legal entity is being set up to deliver the Festival
- Building a loyal audience: 30% of attenders at the 2016 Festival had been to SMASHfestUK in 2015, showing that the Festival is starting to build a loyal following.

NIDSM: These principles were incorporated into the model of delivery, NIDSM – narrative and enquiry driven SMASHfestUK model. The model embraces project-based learning using the narrative of a disaster scenario as the backbone which ties all of the events together thematically. The model also demands that all events are free and must be hyperlocal to the community to be served, and that the intended audience are involved in designing the events which will take place. Our data suggests that around 20% of visitors came following a schools outreach activity, which suggests that this is an important mechanism for building audiences.

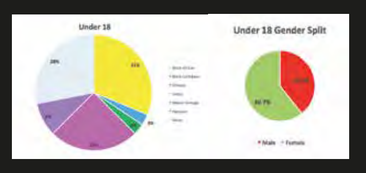
Tyreese Hines had been involved with the Young Mayor of Lewisham where he heard of this SMASHfestUK opportunity. He's studying biology, chemistry and physics at school so felt that being a volunteer would gave him a chance to extend his interest:

"It's important that SMASHfestUK is in Deptford because there's a lot of gentrification and new development. What was a 'bad' area is being sorted out and it's great that there are events like this that bring a chance to people who wouldn't usually engage. Young people liked how the Festival was on the High Street, with games and outdoor activities and they could come in and enjoy themselves. They don't see these sorts of things in the rigid environment of school and they can't explore these sorts of ideas. I enjoyed explaining ideas to children and parents and I learned a lot of new things that you don't usually put together in the conventional sense. The arts make it all more creative and putting things together in different ways reveals the overlaps. For people who don't engage with science it hooks them in and makes them want to find out more.
I'd always wanted to do microbiology. By showing me different ways of doing it and career options SMASHfestUK has confirmed to me what I want to do.
I learned new skills by being thrown in at the deep end to help run SMASHfestUK activities. Engaging with the public has made me feel more confident and independent."

IMPACT

Why Deptford? *< Why Woolwich? Why Colindale? Why...? >*
Deptford is a particularly appropriate location for SMASHfestUK. 50% of young people in Deptford live in poverty, and 75% of young people in schools are BAME. The Festival aims to engage economically disadvantaged young people directly by bringing informal science-engagement activities into the community. Presenting the Festival in venues that already have the trust and awareness of the local community helps this engagement process. By holding the Festival in The Albany and Deptford Lounge Library alongside on-street performances, young people and their families were invited to be inquisitive and participate within their comfort zone. The Festival provides an important entry route into STEM subjects as well as stimulation and engagement for young people, who 'should be inspired and engaged with science in order to continue developing the next generation of brightest minds.' Introducing STEM topics to young people within their own community makes them accessible and helps remove the barrier that science is 'not for the likes of us' by giving them a positive experience of science; 'it is for you'.

SMASHfestUK was targeted at under-18s, particularly those who are BAME.
The table below shows that SMASHfestUK succeeded in attracting a very diverse audience:



Age of audience
In Lewisham Borough, one in five of the overall population is under 15, but this is doubled in the Bangladeshi group, and more than more than doubled in the Black Other group. The under 15 proportion is lowest in the White and Chinese groups. The proportion in the over-65 group is highest in the White, Black Caribbean, Indian, and Chinese groups.

What is PBL?
Problem Based Learning (PBL) is an educational method that engages students in inquiry-based real world problem-solving. Used extensively in medical education since the 1970s, PBL is an instructional approach that teaches students "how to learn" by collaboratively solving authentic industry problems. While already adopted in fields including business and law, it is only beginning to emerge in science, technology, engineering and mathematics (STEM) education. PBL is an exciting and challenging alternative to traditional lecture-based instruction that provides students with learning experiences that engage them directly in the types of problems and situations they will encounter in the 21st century workplace. Students of PBL become active participants in their own learning as they encounter new and unfamiliar learning situations where problem parameters are ill-defined and ambiguous — just like in the real world. When utilizing the PBL approach, learning occurs collaboratively in small groups, problems are presented before any formal preparation has occurred — the problem itself drives the learning — and new information is acquired via self-directed learning. Research shows that compared with traditional lecture-based instruction, PBL improves:

- Student understanding and retention of ideas.
- Critical thinking and problem-solving skills.
- Motivation and learning engagement.
- The ability to work in teams.
- The ability to transfer skills and knowledge to new situations.

The PBL Challenge model is designed to scaffold student learning by acclimating students to PBL through their own learned experience. Instructors have the option to choose an implementation approach to PBL that range from the structured (entirely instructor-led, least student autonomy), to guided (instructor-guided, increased student autonomy) and open-ended (instructor as facilitator, most student autonomy) levels based on students' experience with PBL.

Laitan Odubiyi, a Young Science Explainer, got involved with SMASHfestUK because he is doing A levels in STEM subjects and is interested in science research and new technological developments and wanted to practice explaining such ideas - and SMASHfestUK:

"looked fun and different... I met science experts–like an eco-geneticist and someone from an organisation that sends satellites to the sun and tried a virtual reality headset. Seeing what other people do was mind-blowing as 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.' I'd read up on subjects before the Festival so I felt prepared and I had covered a lot in my GCSE so I got the gist. Over the three days of the Festival I learned improvisation skills and I was expected to do all sorts of things... I had to work on a stand with a big plasma screen and show people how it worked – I got better at doing this and felt proud of myself. It's convinced me about a career in science."

Conclusions:

From our audience demographic analyses, we have shown that we are able to engage the local Deptford audience, which equated to, amongst under 16 visitors to SMASHfestUK, over 70% BME. We suggest that this puts paid to the term "hard to reach" because we have shown that the audience are there, and relatively easy to reach as long as you are willing to work in the community.

·"hard to reach" audiences are not "hard to reach" but you have to go to them, don't expect them to come to you.
·Local communities such as Deptford are disenfranchised by centralised organisations taking swathes of funding that do not engage these audiences. THIS A BIT TOO HEAVILY WORDED!!!

- It's NOT about the building, its about the space.

- *"Universities should have a 'duty of care' for the local and wider community. With public funding comes privilege AND responsibility"*

www.smashfestuk.com tel: 020 3859 6986 email: Info@smashfestuk.com

Supported by: The Royal Observatory Greenwich, The National Maritime Museum, Greenwich & Lewisham Young People's Theatre, The Albany, The Deptford Lounge, Lewisham Council, The Honriman Museum, The Science Museum, The Natural History Museum

Main Partners & Sponsors:

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