Communities and Narratives in Neglected Spaces: Voices from SMASHfestUK

Abstract: Many people are under-served by existing informal science learning (ISL) provisions and under-represented in STEAM (Science, Technology, Engineering, Arts, Mathematics/Medicine) study choices and careers. This paper reflects upon SMASHfestUK which was established, as both a STEAM festival and research platform, to explore methods and approaches for lowering the barriers to engagement with ISL in marginalised communities. To do this SMASHfestUK located its events in the heart of communities and worked with those communities to create those events. This paper tells their story through the voices of participating communities.

The Story of SMASHfestUK

Many people, including families living with multiple deprivations, and black, black-heritage, and black mixed-heritage families, are under-served by existing informal science learning (ISL) provisions and under-represented in STEAM study choices and careers [Archer, 2013; Neelands, 2015]. SMASHfestUK is a science and arts festival that was established in 2015 specifically to engage underserved and under-represented communities, and its approach to community engagement was a co-design lead iterative prototyping of the festival and the events within it. This approach was developed into a model for inclusive engagement called "SCENE" (STEAM/Community/Entertainment/Narrative/Enquiry). SMASHfestUK was delivered in Deptford, South East London from 2015-2019, but also delivered "pop-up" events in other areas of England and Wales including Colindale, Woolwich, Gloucester, Bradford, and Neath.

This co-design process involved the active participation of stakeholders, including target communities, collaborating organisations and funding bodies. This determined that each festival would be driven by the story of a fictional natural disaster; a 'unifying threat to humanity'. The story was adapted for each location so that it became specific and meaningful for each participating community; an approach we describe as 'hyperlocal'. SMASHfestUK has a focus on the use of ordinary, everyday, accessible locations in town-centres, community halls, libraries and other public spaces. Spaces which have a high public footfall and a low barrier to access for marginalised communities. The overarching "disaster narratives" used in the festival create scenarios for performances, demonstrations and interactive experiences that encourage communities to understand the impact and importance of the STEAM that underpins our everyday lives by exploring what would happen if they lost their housing, habitats and infrastructure. It calls on participants to "save the world" or to rebuild

civilisation, or even colonise space. This commentary explores the various manifestations of the approach and principles in differing community settings. These include a local community library and social space (The Deptford Lounge), a community theatre (The Albany, SE8), a central town library (Gloucester), a central public town square (Centenary Square, Bradford), a "Market Square" at the centre of the main town shopping zone (Neath), and in Colindale, it was open ground at the centre of the Grahame Park Estate, one the UK's largest social housing schemes. All events were well-attended with a good representation from groups normally marginalised by science festivals. This commentary explores the reasons why local communities who are socio-economically disadvantaged can be found in neglected spaces, using the voices of that community to tell their story, and illustrating the power of listening, locality and co-design to empower and engage underserved audiences.

This is the story of SMASHfestUK through the words of the people who co-designed, co-produced it, and shaped it: the participant community [McKenzie, 2015; Jarvis, 2016; Simons, 2017, 2018].

> *"Nobody ever comes here..."* <

Figure 1A   Figure 1B   Figure 1C

Figure 1 Examples of audiences attending SMASHfestUK events in Woolwich (Figure 1A), Colindale's Grahame Park Estate (Figure 1B) and Neath town centre in Wales (Figure 1C).

Listening: People, places, insights, stories, a process.

Co-design in the context of SMASHfestUK was considered as a form of participatory action research, processes that have been found to be effective in the successful creation of effective end "products" or "services" as well as empowering citizens and positively affecting policy [Bardill *et al.*, 2010; Sanders and Stappers, 2014; Voorberg *et al.*, 2014; Conway, Masters and Thorold, 2017]. The early co-design process showed a gravitation by young people we worked with towards excitement, adrenaline and adventure. With the process providing prompts, we asked; "What if…?" Answers and ideas flowed freely "A news reporter tells us…", "that perhaps there's a...?" "'Disaster!", "Fire!", "Earthquake", "Plague!", "There was another

meteorite!" But where? "In Deptford!" "Our houses and food had been burned."
"Zombies", "People were turning into zombies…" We could...? "Go on an adventure!"

For some co-designers the follow-on effects of these types of comments from young
people seemed clear: "I just realised that if we introduce STEM subjects to these
children especially the very young ones. We can inspire them to be more interested
in them. We can let them know that these subjects shouldn't be things that we grow
up to avoid or develop a fear for."
And for the designers and artists who would work with the festival the insights were
equally important; "Being able to carry out co-design workshops in the primary
school we visited as a team of designers it allowed me to understand the thought
process of the children as well as how they communicate and interact with each
other and the grown-ups around them."

Figure 2A   Figure 2B   Figure 2C

Figure 2 Co-design workshops and activities in Deptford, SE London (Figure 2A),
Figure 2B Deptford, Pepys Estate, Riverside Youth Club drama and story
development workshop with Uncover Theatre Group and UCL research engineer,
Michael Sulu and Figure 2C a co-design workshop involving Lewisham's Young
Mayor's office and Pupil Ambassadors.

More listening: Where? Who?

Various studies from health and public engagement settings have shown that there
is "distance from university penalty" for engagement activities and that researchers
travelling to community spaces was an effective (if resource-heavy) way to reach
people who were historically dubbed "hard to reach" [Bonevski *et al.*, 2014;
McCracken, 2017; Audience Agency, 2018]. For this reason it was decided that the
festival would create events in the heart of the communities we wanted to reach.
When Swansea Science Festival asked us to participate, we asked "which local
communities won't you reach?" Neath was the answer and so the festival went to
Neath. Neath is among the most disadvantaged areas in Wales. Any activities they
said, "that can be taken to the region would have a hugely beneficial impact."
Nevertheless we received warnings from some quarters. "Whatever you do, don't go

to the Grahame Park Estate," but these warnings were eclipsed by expressions of surprise by visitors at events; "No-one ever comes here…", "Why are you here?", "What are you doing here today? No-one ever comes here".

The premise: neglected communities, excluded groups and access to Informal Science Learning

Although it has been reported that the barriers to inclusion are many [Dawson, 2014, 2019; Whitaker, 2016; Audience Agency, 2018], it was important to hear the voices of our audiences in telling us their experiences. Audiences shared the reasons why it was important to reach their communities. "Often people in deprived areas feel that arts and science is not accessible to them", they stressed that "being free is so important, because people in this area really struggle". There was an emphasis in comments on cost-based exclusion, "parents from Deptford cannot always afford it [the cost of entry to paid-for activities] - ordinary working mums. They need things that they can do in half term". There were "not many opportunities in Deptford for kids [that are affordable]".

Participants also expressed sadness that the lack of activities was linked to, what they perceived as, low community cohesion: "Nothing, like this happens where I live and there is no real sense of community. But it is hard, you know, to engage people from deprived areas". Others commented "so many parents said that usually there is nothing in Deptford for children." SMASHfestUK illustrates arguments for the role of "placemaking". Placemaking uses arts and culture to underpin revitalisation and promote community cohesion, however there are also arguments that placemaking simply underpins neoliberal ideologies and that "placeguarding" through arts activism is a more equitable approach to promoting arts and culture in marginalised communities [Markusen, 2014; Thomas, Pate and Ranson, 2014; Pritchard, 2018] . As such, in Deptford, the thoughts of parents and carers were echoed by younger participants who are aware of the exclusionary and divisive effects of "regeneration" and had linked the presence of arts and culture with that same gentrification:

"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."

One particular demographic group marginalised by many forms of ISL are Black, Black heritage and Black mixed-race communities [Archer, 2013; Dawson, 2018]. A young adult contributor to the festival noted the importance of the event to his community personally; "to get STEM to underprivileged and low-income areas and families is something that is absolutely needed. As someone from a BAME background myself, I see the importance of making STEM exciting and creative as well as informative as I was often put off and not interested by STEM as a child."

Figure 3A   Figure 3B   Figure 3C

Figure 3 Intergenerational engagement in community spaces. Figure 3A a young mother with two children in Gloucester library, Figure 3B engaging a local family who were out shopping in Neath town centre, Wales, and Figure 3C engaging a large family group including adult females in a caring capacity.

Equity, representation and inclusion

Recurring themes described neighbourhoods in which communities who felt excluded from cultural institutions or higher educational establishments. These communities were empowered by the presence of people representing these organisations in their own space: "it [SMASHfestUK] gets people excited. It is a gateway to a sense of something different that opens up ideas beyond the everyday. Bringing experts in from universities as well as creative arts people is an inspiring and imaginative approach to engaging people in science and empowering them to think more about their world."

There is evidence regarding the importance of role models in STEM engagement [Herrmann *et al.*, 2016; Shin, Levy and London, 2016], so ensuring diversity in staffing of the festival was important and this was noted by audiences. "Seeing different people from different backgrounds coming together for one cause was quite beautiful". Audiences brought absolute clarity to the necessity of this approach:

"For people of colour, the yardstick [for science and engineering] is very much white males – so to see women and women of colour in leadership and in engineering roles here - they are being influenced by that and it is a big confidence boost. In the UK we are always seen as the minority – 'other than' – and I don't want my children to feel this…I know how much representation matters in making choices and seeing yourself in a role"

Equitable representation of ethnicity was extremely important, but it was also important for the building of strong science identities in girls [Steinke, 2017], that we had broadly equal representation of women scientists:

"Lots of adults and young people coming together to have fun and learn. And it's free! Affordable activities that have thrilled my daughter throughout

her holiday. A local event for friends and family. Inspiring my daughter that science is fun, is artistic and is for girls."

Figure 4A   Figure 4B   Figure 4C

Figure 4 Engagement empowerment featuring a mother with 2 children (Fig 4A) and a father and son (Figure 4B) at events in Colindale and Deptford, SE London. Figure 4C shows staff and volunteers at a SMASHfestUK event in Woolwich, SE London.

Other visitors reported on the importance of the festival in encouraging intergenerational learning and rekindling a love of science in adult visitors, who were mostly parents or carers:

"I actually like doing these activities myself, I used to know how to do this – but I forgot – so it is good to learn these skills again. I do actually work with children"

Intergenerational learning, leading to discussions with family members is known to be another effective way of embedding science in families, and also sustains progression in learning [Dou *et al.*, 2019] , and so where possible this was fostered and seemed to have a positive effect with visitorsThey described, "we talked about it [the festival] quite a bit and remembered what we had done and which our favourite bits were" and how "[SMASHfestUK] sparked many conversations amongst us…as well as looking into qualifications and career routes".

"My son wrote about it in his journal and we bring up things we heard and learned on the day in daily activities. We will refer back to Smashfest events in future activities. He continues to show others his science experiment papers so is learning by retelling it each time"

Personal, community and collaborative futures

For some young adults, the experience of SMASHfestUK crystallised their intentions to follow a STEM career: "I met science experts– 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… 'if they can do it - why can't I do it too?". The

experiences also highlighted to young adults the possible opportunities for younger participants, including siblings:

"They don't see these sorts of things in the rigid environment of school and they can't explore these sorts of ideas for free which is important in an area with a lot of poverty and where kids get limited exposure to opportunities. This has a knock-on effect because it means as kids progress they can't recognise opportunities or have the skills to know what to do even when opportunity is facing them – and they are unsure how to engage."

The collaboration-based approach to the festival also provided the beginnings of a community of practice amongst researchers and practitioners engaging with the co-design and inclusion principles. One said: "I feel SMASHfestUK has had a direct benefit on me as a local resident as well as a practitioner. It's enormously important that all communities have a place to congregate and moments in the year which lift us out of the ordinary and give us cause to think about who we are as people and as a society". Another reflected upon the effect of SMASHfestUK's approach on their personal practice saying; "Collaborations are useful for creativity as you see other people's interpretations and views, so can learn a lot and can develop something even better." In some cases the effect of participation was to change pedagogical practice, with a Senior Lecturer noting: "These events have really underpinned for me the importance of tangible, easily explored examples to motivate and understand engineering problems. Physical manipulation of a problem is a really powerful way of fostering engagement, and I'm looking now to apply this principle to the purer ends of the mathematics I teach." But, the importance of the co-design process also conferred a sense of ownership to visitors: "Because they are making or doing things themselves the children have a personal investment with the arts and science because it is tangible – they can take it home".

Using stories and immersion encouraged visitors to create personal narratives, and in doing so, through the process of narrative transportation, they built a positive and sustainable science identity [Green and Brock, 2000; Gallagher, 2011; Keith and Griffiths, 2020] and their responses in evaluation suggest this may be effective. Asked what they had learnt as a result of the experience, our young audiences responded, positively: "I AM a scientist!" and "I saved the world!", "Science is Awesome!", and "I am a HERO!" Whilst, adult visitors were more contemplative; "I did the immersive Montserrat volcano experience - listening to the kids reveal their volcano stories made me ponder and imagine that I was there." Some ascribed the learning to the story and immersion directly; "I think the immersive aspect was the most important. The kids were constantly engaged and it helped get the message across". At an event in February 2020, which told the story of a novel disease causing a pandemic, one adult said "…almost as weird as real life!" and again, made a link to the the future of the audience members: "I truly believe that the work SMASHfestUK do…allows children to understand concepts in an engaging manner.

It is the work of organisations such as this that will see young children want to go into a STEM career whilst still being creative and considerate." And even those who did not enjoy it themselves, saw some benefits; "I'm not a fan of 'immersive' events - I find it claustrophobic. But I think my children enjoyed it!"

The specificity of being immersed in local stories, that felt personal and bespoke, was recognised:
"The activities give them an insight into how they would cope if there was a flood and what could be done…The issue of growing things after a flood, we had a discussion about back at the kid's club, because all of the soil would be flooded – so you could grow some plants just in water – the children were really interested in that and it started a really interesting conversation with them."
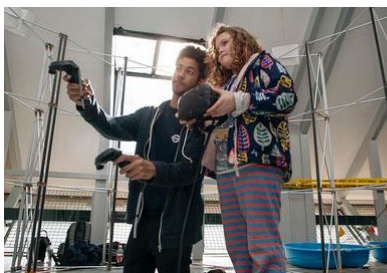

Figure 5A   Figure 5B   Figure 5C
Figure 5 ISL interactive activities with overarching storylines: In Figure 5A from SMASHfestUK 2017 "Supervolcano". Figure 5B shows a young visitor engaging with planetary scientist Dr Hannah Sargeant in Colindale, 2017, and Figure 5C shows a young visitor in Gloucester learning how to become an astronaut.

Concluding for the next cycle
The SMASHfestUK approach is to consider each event an iterative prototype, always changing and always improving and always requesting feedback,. Future suggestions include "more themes", "even more storytelling", "extra activities", "more for under 6's", and "crib sheets…to take away" and to "be [available] at home".

Having explored the advantages of the SCENE model for engagement through live events and festivals, our next iteration of the model will be engaging through digital means. The development of SCENE (STEAM/Community/Entertainment/Narrative/Enquiry) has interwoven with and driven the festival and co-design programme cycle. The headline components – interdisciplinary/cross-sectoral, "in the community, with the community", lead on entertainment, the narrative drives all levels of the experience, and the engagement is active and enquiry-based are

illuminated through the reflections of the participants in this commentary. The next, digital, iteration will be within a videogame, exploring how these model components and the effect of building positive science identities through narrative transportation might be replicated online and at home. This intends to deepen the relationship with 'narrative transportation', but critically, will continue to embed each player's experience locatively in their own community. Personalised, localised digital engagement offers the potential to reach more communities, for longer, more repeatedly, providing more content, and more experiences than the resource-heavy live experience model, however, issues surrounding digital exclusion bring their own addition challenges and these will have to be addressed.

In summing up, we point to a critical study of exclusion in science engagement which ended with a call to arms: "We could commit ourselves to a total radical alternative to the types of everyday science learning that currently exist. It may be hard to imagine what this could look like…but together we can envision and manifest this alternative" [Dawson, 2019]. We have co-designed with our collaborating communities for six years resulting in a set of principles underpinning a new model for inclusive engagement, "SCENE" and exploring how we might make SCENE work in the digital space is our next step in trying to understand this challenge.

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