

1 **Communities and Narratives in Neglected Spaces: Voices from SMASHfestUK**

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

12 **Keywords:** Science communication: theory and models; Social inclusion; Informal
13 learning

14 **The Story of SMASHfestUK**

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

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

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

52 This is the story of SMASHfestUK through the words of the people who co-designed,
 53 co-produced it, and shaped it: the participant community [McKenzie, 2015; Jarvis,
 54 2016; Simons, 2017, 2018].

55
 56 > “*Nobody ever comes here...*” <

57



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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).

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

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

70 meteorite!” But where? “In Deptford!” “Our houses and food had been burned.”
 71 “Zombies”, “People were turning into zombies...” We could...? “Go on an adventure!”
 72

73 For some co-designers the follow-on effects of these types of comments from young
 74 people seemed clear: “I just realised that if we introduce STEM subjects to these
 75 children especially the very young ones. We can inspire them to be more interested
 76 in them. We can let them know that these subjects shouldn't be things that we grow
 77 up to avoid or develop a fear for.”

78 And for the designers and artists who would work with the festival the insights were
 79 equally important; “Being able to carry out co-design workshops in the primary
 80 school we visited as a team of designers it allowed me to understand the thought
 81 process of the children as well as how they communicate and interact with each
 82 other and the grown-ups around them.”
 83



84
85 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.

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88 **More listening: Where? Who?**

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

100 Nevertheless we received warnings from some quarters. “Whatever you do, don't go

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

104

105 **The premise: neglected communities, excluded groups and access to Informal** 106 **Science Learning**

107

108 Although it has been reported that the barriers to inclusion are many [Dawson, 2014,
109 2019; Whitaker, 2016; Audience Agency, 2018], it was important to hear the voices
110 of our audiences in telling us their experiences. Audiences shared the reasons why it
111 was important to reach their communities. “Often people in deprived areas feel that
112 arts and science is not accessible to them”, they stressed that “being free is so
113 important, because people in this area really struggle”. There was an emphasis in
114 comments on cost-based exclusion, “parents from Deptford cannot always afford it
115 [the cost of entry to paid-for activities] - ordinary working mums. They need things
116 that they can do in half term”. There were “not many opportunities in Deptford for
117 kids [that are affordable]”.

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

132

133 “It’s important that SMASHfestUK is in Deptford because there’s a lot of gentrification
134 and new development. What was a ‘bad’ area is being sorted out and it’s great that
135 there are events like this that bring a chance to people who wouldn’t usually
136 engage.”

137

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

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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.

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Equity, representation and inclusion

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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.”

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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:

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“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”

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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:

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“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

179 her holiday. A local event for friends and family. Inspiring my daughter that
180 science is fun, is artistic and is for girls.”
181



182
183

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.

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

189

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

193

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

202

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

207

208 **Personal, community and collaborative futures**

209

210 For some young adults, the experience of SMASHfestUK crystallised their intentions
211 to follow a STEM career: “I met science experts– Seeing what other people do was
212 mind-blowing as I’d never actually met people who work in such scientific fields or
213 pursue academic careers... ‘if they can do it - why can’t I do it too?’. The

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

216

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

223

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

242

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

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

262
 263 The specificity of being immersed in local stories, that felt personal and bespoke,
 264 was recognised:

265 “The activities give them an insight into how they would cope if there was a flood and
 266 what could be done...The issue of growing things after a flood, we had a discussion
 267 about back at the kid’s club, because all of the soil would be flooded – so you could
 268 grow some plants just in water – the children were really interested in that and it
 269 started a really interesting conversation with them.”

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271
 272

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.

273

274 **Concluding for the next cycle**

275 The SMASHfestUK approach is to consider each event an iterative
 276 prototype, always changing and always improving and always requesting
 277 feedback,. Future suggestions include “more themes”, “even more
 278 storytelling”, “extra activities”, “more for under 6’s”, and “crib sheets...to
 279 take away” and to “be [available] at home”.

280

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

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

300
301 In summing up, we point to a critical study of exclusion in science
302 engagement which ended with a call to arms: “We could commit ourselves
303 to a total radical alternative to the types of everyday science learning that
304 currently exist. It may be hard to imagine what this could look like...but
305 together we can envision and manifest this alternative” [Dawson, 2019].
306 We have co-designed with our collaborating communities for six years
307 resulting in a set of principles underpinning a new model for inclusive
308 engagement, “SCENE” and exploring how we might make SCENE work in
309 the digital space is our next step in trying to understand this challenge.

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