

National Science & Engineering Week

Executive Summary:

**Review and Recommendations
for
Future Development**

Report produced June 2014



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1.0 Introduction

National Science & Engineering Week (NSEW) aims to inspire and engage people from all walks of life with science, engineering and technology. The routes and mechanisms for engagement with the public are both numerous and multi-dimensional, enabled through a UK-wide network of event organisers, ranging from grass-roots community-led organisations to well-established institutions with international reputations.

For this research study the British Science Association (BSA) has for the first time taken the opportunity to gain a comprehensive understanding about who the audience for NSEW are and which elements of the UK population are under-represented at their various events, talks and exhibitions. The literature review identified three specific groups that have historically been under-represented within STEM professions:

- Women
- Those from certain ethnic backgrounds
- People identified as having lower socio-economic status (SES)¹.

The combined research undertaken by &Co strongly suggests that the key challenges faced by BSA, in seeking to improve the relationship between science and the public through NSEW are three-fold:

- How can a programme of activity be created and delivered successfully when BSA has little or no curatorial or commissioning control over the content on offer?
- How can BSA direct resources to low SES target groups who are the least well-served in PES² terms when considering the population variances and societal disparity across the country?
- How can engagement with target audiences be nurtured and developed all year round so as to build trust, create rapport and increase frequency of engagement – resulting in increased science capital within these groups over the longer-term?

This short summary contains the distilment of the information collected by &Co and subsequent analysis. Our fieldwork and subsequent focus groups with young people, forms the foundations upon which this report is based.

The research element of this study provides a snapshot of the audience for NSEW 2014 and a limited insight into the needs and expectations of different socio-economic

¹ Socioeconomic status is typically broken into three categories, high SES, middle SES, and low SES to describe the three areas a family or an individual may fall into. When placing a family or individual into one of these categories any or all of the three variables (income, education, and occupation) can be assessed to determine which category they inhabit. Throughout this report low SES is defined as 'Urban Adversity' and 'Financially Stretched' a sub-group within CACI's Acorn geo-demographic segmentation model.

² PES – Public Engagement with Science.

groupings who participated in one or more of the 2014 events. As with most early stage research, it is important to view the findings contained within this report as indicative, often raising more questions than they answer, but certainly useful for shaping the debate and shining a spotlight upon themes worthy of further investigation.

Shaun Romain, Alison Edbury, Susan Ingham, May 2014.

2.0 Methodology Overview

Desk research was conducted to identify the areas with the highest proportions of economically disadvantaged groups. Fieldwork was targeted at NSEW 2014 events which were:

- Open to the public (not school events)
- Broad in appeal
- Located in areas with multiple events taking place to enable crossover analysis
- Located in areas with a high percentage of economically disadvantaged groups (i.e. with a high percentage of the Acorn³ segment 'Urban Adversity').⁴

In addition, a link to an online version of the survey was circulated to boost response rates. To qualify for the survey, respondents had to be UK residents aged 16 or above, and they had to have attended a NSEW 2014 event.

The fieldwork situated at 22 events across Great Britain generated:

- 566 responses with online responses of 37 to bring the total sample to 603.
- 532 respondents provided recognisable UK residential postcodes to enable economic & lifestyle segmentation using Acorn classifications, and these responses are represented in the report. Due to rounding, not all responses will total 100%.

In addition to the fieldwork and desk research two focus groups were undertaken with the help of groups based in Nottingham (Chat' Bout⁵ and Nottingham Youth Cabinet). Nottingham was selected because the socio-economic composition of the city mirrored much of the UK's overall make-up. The aim of the focus groups was to explore participant's response to NSEW 2014 and to identify the key communication mechanisms and product offerings that would appeal to not only them as individuals but also their friends and families.

To inform and contextualise the fieldwork and focus groups we created a short report that synthesised over forty documents that address a range of issues that relate to Public Engagement with Science (PES). Finally we undertook a day long business development workshop with a dozen key BSA staff, exploring how the audience research could be applied to the future development and delivery of NSEW and how new business and planning processes might be embedded into BSA's day-to-day practice.

³ Acorn - A Classification Of Residential Neighbourhoods

⁴ Fieldwork sampling and population profiling were carried out using CACI Ltd.'s Acorn segmentation, focusing on the Hard Pressed category which constituted 21% of the UK population. Following closure of the survey, the Acorn model has been re-presented and the poorest economic group has been re-titled Urban Adversity. It now represents 17% of the UK population as some households have been re-classified into the Financially Stretched category.

⁵ An organisation of young people with voices and opinions, involved in shaping their community and community events.

3.0 Key Findings

3.1 Introduction

The key findings outlined below frame the context and operating environment in which BSA delivers NSEW and briefly outlines the key characteristics of the 2014 event.

3.2 The audience for NSEW 2014 (Public Programme)

- NSEW was most popular with those who represented the higher end of the socio-economic scale (Affluent Achievers⁶), with almost 1 in 3 being from this group.
- The middle socio-economic groups were broadly present in proportion to the UK population as a whole.
- The lowest socio-economic group (Urban Adversity⁷) were under-represented by a third compared to the UK population.
- 95.5% of NSEW 2014 survey respondents described themselves as White.
- Two-thirds attended as part of a family group, 11.2 % came with friends, 9.5% with a partner.
- 58% of the audience were under 16 years old.
- The adult audience (16+) was very well educated – almost 50% had a first degree or higher, compared to 27%⁸ for the UK population overall.
- Satisfaction was high (over 90% were positive), churn was also high (75% first-time attenders).

⁶ See Appendix 7.1 in the main report for details about Acorn geo-demographic segmentation.

⁷ See Appendix 7.1 in the main report for details about Acorn geo-demographic segmentation.

⁸ 2011 Census Analysis, Local Area Analysis of Qualifications across England and Wales Release. 07 March 2014.

3.3 Challenges faced by NSEW

Outlined below are the key challenges faced by NSEW and more broadly by those involved with the delivery of PES.

3.31 Reaching under-represented groups with low socio-economic status

- Specifically Pakistani, Bangladeshi and Black children and young people; those living in workless households; and those from single parent households face the greatest probability of experiencing multiple deprivation in adulthood.⁹
- Low SES families and individuals face a range of complex barriers that significantly reduce their opportunities to participate in different leisure, cultural and educational activities:
 - Practical constraints (looking after siblings; long working hours / multiple jobs etc.)
 - Environmental constraints (low-levels of family and science capital)
 - Economic constraints (unemployment and low paid employment reduce opportunities)
 - Time constraints (children with greater domestic responsibilities etc.)
 - Educational constraints (limited time, knowledge and skills to help support learning)
 - Information constraints (restricted access to digital content)
- Family capital plays a key role in cultural and educational engagement; parental attitudes to science closely influence their children's science aspirations. This is more than the parents' general involvement in their child's schooling or their general aspirations for their child.
- Middle-class families' economic, social, and cultural capital enables children to participate in a greater volume and variety of science-related extra-curricular activities than those from less affluent and less academically successful households.
- The public events surveyed at NSEW 2014 were all in places with diverse socio-economic and ethnic populations. NSEW 2014 participants with the lowest socio-economic status were under-represented by a third when compared to their overall presence in the UK population.

3.32 Engaging communities from a range of different ethnic backgrounds

- Different ethnic groups face their own range of specific challenges when engaging with science. These include:
 - A lack of rapport and trust with PES providers
 - A mismatch in expectations – the popularisation of science can be viewed as trivial
 - Few role models

⁹ Ofsted, 2013.

- Limited science capital (though this is not specific to BAME)
 - English as an additional language
 - Cultural / belief conflicts and paradoxes
 - Views about women which preclude their involvement in science and learning events etc.
- Non-White ethnic groups were under-represented by a factor of 3 at NSEW 2014 (4.5% compared to 14% in the overall UK population).

3.33 **Becoming sensitive to non-dominant cultures**

- It is customary to present science (in the UK) from a euro-centric position, something that can appear alien to those who do not associate closely with the dominant culture and the corresponding inherent views associated with this group.
- There are a growing group of people whose beliefs, education and understanding of the world they inhabit are at odds with the current presentation of science.

The following challenges are ones that are specific to NSEW and BSA.

3.34 **Having sufficient capacity and knowledge to reach new audiences**

- Currently the NSEW team are organised to deliver the programme element of the annual event and as a result have developed strong B2B¹⁰ practices; but the small size of the team precludes the necessary B2C¹¹ capacity required to build the audience and target specific harder to reach audience segments.
- Small teams naturally have greater limitations when it comes to their range of knowledge and expertise – specifically in this instance in relation to audience development.
- The organisation's reach into low SES communities is limited and without regional representatives could become smaller still.

3.35 **Constructing a brand that appeals to different groups**

- What the NSEW partners currently offer was viewed very positively by the 2014 audience. This strongly suggests that product development need not be an immediate developmental priority. Though if this was to change, BSA has very few ways by which they can influence the NSEW product as they are currently reliant upon the programming choices of their delivery partners.

¹⁰ B2B – Business to Business.

¹¹ B2C – Business to Customer.

- NSEW has a very small physical footprint in the numerous locations events occur. This lack of visibility is reducing brand awareness and subsequent attendance numbers.

3.36 **Building strong delivery partnerships**

- A key weakness of the current delivery model is that BSA is dependent upon the quality and effort of the delivery partners across the UK.
- Existing partnerships with content providers are adhoc and currently lack a common vision – particularly in relation to targeting harder to reach audiences.

3.37 **Giving people more of what they want**

- People want bigger events, aimed at people with little or no science and engineering capital, in places they commonly visit.
- People want a sense that something is going on – a critical mass of opportunities and activities in their locality.

3.38 **Different audiences require different routes to market**

- Currently BSA's disconnect from its NSEW audience proves to be a significant handicap when looking to create meaningful relationships across all strata of society.
- The NSEW web presence via the BSA website is only capable of delivery B2B processes and lacks any abilities to capture interested party's contact details (B2C) and subsequently communicate to them.
- Advertising! Advertising! Advertising! is what survey respondents said NSEW lacked, they simply didn't know it was on, or if they did, people found it challenging to obtain event details.
- The marketing and communication effort had a minimal effect when trying to attract low SES groups.
- There was high year-on-year churn across all segments of the 2014 audience. High audience turnover is expected to remain an ongoing challenge as NSEW currently has insufficient mechanisms by which to communicate with former participants or those with a known propensity for engaging with science and engineering – limiting their ability to build ongoing relationships with their audiences.

4.0 Recommendations for future development of NSEW

4.1 Equip BSA with the skills and knowledge to meet your audiences' needs

Currently there is an over-reliance upon individual staff members and small teams of co-workers to deliver projects often when their individual areas of expertise are more subject-specific rather than delivery-specific. This is particularly true in relation to audience development.

- To help remedy this, we suggest that BSA adopt a tried and tested method known as the Audience Engagement Cycle – designed as a 6-step process to engage audiences.

4.2 Meet the needs of low SES families and individuals

To support future audience development for NSEW, it is useful to dis-aggregate the overarching SES target groups into discrete segments (both consumer and business markets), that will enable more effective targeting with the relevant product type and via the most appropriate communication channels.

4.3 Making the NSEW brand more appealing

- For the brand of NSEW to be seen as a valuable proposition to target audiences, it needs to fit with the values of the respective target consumers. By understanding the values of different target audiences you can ensure your product creates an experience that fits their lifestyles and it then follows that your marketing effectively delivers your brand promise in a creative, relevant and differentiating manner.

4.4 Diversity of representation

BSA by acknowledging the numerous factors hindering science aspiration should develop positive steps to portray NSEW in an appealing way to different under-represented groups.

- NSEW should encourage delivery partners to adopt a positive approach to featuring visibly different, non-stereotypical representations of those involved with science at future NSEW events.

4.5 **Priority marketing messages for NSEW – It's more fun than rocket science!**

When thinking about how science engagement might fit into a young person's life, we need to consider what NSEW has to compete with after school, at weekends and during holidays. For NSEW to be prioritised as an activity by young people aged 14 to 16 years it needs to capture their interest and imagination in a way that fits their lifestyle.

- BSA should think about whether it is appropriate to prioritise developing relationships with non-formal education partners to ensure a better appeal for younger audiences. We recommend that targeted partnership development with science centres and museums or other community / arts / cultural organisations would support the future growth in audiences for NSEW.

4.6 **Priority marketing messages for NSEW – Science is all about you!**

Different audiences bring with them their different learned associations with the word 'science' – both positive and negative – and this affects their perceptions of NSEW.

Studying STEM subjects is often seen by young people as a limited avenue to pursue when thinking about prospective careers. However, when given the chance to think more holistically about the relationship and value of science to everyday life, positive associations are more forthcoming¹².

- The mixed messages conveyed here is an area that clearly needs to be tackled when promoting NSEW which has the challenging term 'science' in its title and brand.
- For the longer term, NSEW would benefit from having a regular user group to advise on the design and content of its marketing and communications materials.

4.7 **Priority marketing messages for NSEW – It's a fun family day out, and more!**

The high proportion of family groups has a profound impact upon the overall make-up of the NSEW 2014 audience.

- A key consideration for NSEW is how to maintain a place in these families' lives beyond the 10-day programme in March. For those family groups who do attend, they need to be considered as a consumer market segment that BSA communicates with directly rather than relying upon delivery partners.
- To start a simple online sign up to NSEW would enable BSA to start to develop a customer relationship database and put itself in direct contact with its users.

¹² 'Project: Engage' (draft), R. Atkinson, K. Siddall, C. Mason, Platypus Research, February 2014

4.8 **Priority marketing messages for NSEW – Price is not a problem!**

- Where charging for entry to NSEW event venues or to attend specific events does occur, the aspects of pricing and packaging need to be considered carefully.
- Free entry / reduced pricing and free passes for friends were mentioned by respondents to the audience survey as a benefit that would increase their propensity to attend.

4.9 **Priority marketing messages for NSEW – Come with your friends!**

To promote attendance with friends it would be beneficial to consider the possibility of implementing a pricing policy for NSEW.

- Such a proposed pricing policy would need to consider whether delivery partner venues require any potential financial losses covering, or whether, in anticipating that events are not always at full capacity, there is simply a limit set to how many special group discounts are made available on a first come first served basis per event or venue concerned.
- This would also require BSA to have more direct control over its relationship with its product by setting a new pricing policy but this also enables the development of a more strategic relationship with its delivery organisations.

4.10 **Routes to low SES individuals and families**

The existing marketing and communications output for NSEW 2014 had little or no influence upon the low SES group in motivating them to attend. Along with all the other Acorn categories, word of mouth proved to be the strongest communication channel for those people who have a low SES (54.8%).

- To reach low SES communities NSEW needs to be on the inside of these people's lives – with family, friends and youth group workers etc. all helping to promote the engagement opportunities created. Only through a variety of trusted routes and voices will a strong enough pull be created to ensure significantly larger numbers of low SES individuals and families participate in NSEW 2015 and beyond.
- Events which provide limited appeal to children and young people or indeed adults with limited science capital will prove an unattractive leisure option for the vast majority of low SES families and adult groups. If NSEW is to shift its offer towards attracting far greater numbers of low SES groups, it will have to do so through offering far more public facing events that are both attractive to an inter-generational audiences and ones with little or no science or engineering capital.
- Added to this the choice of location will be imperative. Locations that are not commonly used by the target audience are highly unlikely to attract them.

4.11 **Development of targeted communication channels**

Word of mouth was the most prominent information channel for those surveyed. This information channel has historically proven difficult to manage given BSA's limited resources and that customer relationships only exist at the local level.

- BSA needs to rapidly develop its business to customer (B2C) relationships and associated platforms to ensure it does not remain one-step removed from the NSEW audience.

4.12 **Creating a new development model**

BSA is distinctly disadvantaged with respect to the current model adopted for the delivery of NSEW. Centralisation of assets in London means there exists very few opportunities to develop meaningful relationships between the NSEW delivery team and the wider community of partner organisations, science engagement professionals and the public at large.

- BSA can't do everything and would benefit from adopting some of the good partnership practice currently being undertaken in the cultural sector.
- We recommend that up to five locations be included in a pilot programme aimed at developing new working and partnership practices that can subsequently be adopted and rolled out across different cities throughout the country.

4.13 **Building overt and meaningful links between schools and the public programme**

At present there is a disconnect between the schools' programme and the public programme.

It is widely reported that if children are not enthused and interested in STEM by the beginning of their secondary years then they become more likely not to become engaged with these subjects throughout their adult lives. This makes the role of schools in engaging with new target groups for NSEW fundamental to the future development of an engagement strategy.

- BSA has a role in creating the bridge between schools, youth services, the third sector and young people and their families. There are a number of ways of realising this need, many of which might incorporate different PES programme strands currently being delivered by BSA.

Developing the offer

1. Become more visible

Visibility and critical mass were the key criticisms of NSEW 2014.

- Locate the events and activities in places used by low SES groups, including public spaces in city centres.
- Create memorable spectacular events – outdoor events that can attract 1000s.
- Create mini events later in the year and have a user-generated repository of comments and visual content.
- Lots to do, lots to take part in and see, preferably on a single city centre site.
- Condense the activity into a weekend or a single day on a single site.

2. Make it easier to find out about what's happening

Access to information was problematic and consequently there were numerous requests for more information alongside easier access.

- Look to gain partnership with mainstream TV such as *Bang Goes the Theory*.
- More local advertising where people linger – bus stops; hairdressers / barbers / nail shops etc.
- Much more use of pre-existing local networks that concentrate on specific target groups such as young families, teenagers, the unemployed etc.
- During the run-up to NSEW undertake a series of teaser / taster demonstrations / promotions across different cities and locations.

3. Build the NSEW brand

Currently it's a generally unknown brand, so consequently it's not a not a trusted brand.

- Celebrity endorsements were a popular suggestion as to how to raise awareness.
- Targeting the 14-25s – use YouTube / Internet celebrities and exhibit user-generated content.
- Ensure NSEW is perceived as fun and not worthy.
- Currently NSEW has no big brand endorsements.
- NSEW needs a name that's exciting, energetic and without negative connotations.

4. Develop the NSEW offer

- Look beyond science and engineering to its application in different contexts – such as Heston Blumenthal and the science of cooking or more in relation to technology and the future – look at the role of science in cosmetics, medicine, space travel, family history etc.
- Much more about careers and working within STEM industries.

- Let's hear from the experts about relevant topics, but it has to be entertaining and easily digestible.
- Want to see role models – but only ones people with negligible science capital can relate to.

5. Make NSEW more inclusive

- Make it suitable for children and adults, including more facilities / activities for toddlers / under-6s.
- Involve more people with low SES.
- Look to get partners such as Youth Clubs etc. to organise trips / visits to NSEW.

6. Add value through participation

- Offer incentives for multiple participations.
- Establish volunteering opportunities and internships to help deliver NSEW.
- Link to the curriculum so participants get a certificate or involvement can be linked to recognised qualifications such as Arts Award etc.

4.15 Managing the audience relationship

Currently NSEW is very much a project in which BSA solely has a relationship with the delivery partners and not with the audience.

Without a direct relationship with the audience, NSEW witnesses an inevitable churn¹³.

The high level of churn is indicative of a lack of a sustainable and on-going relationship between the commissioner and the consumer.

- It would be extremely profitable to invest in developing a suitable Customer Relationship Management system that can be used to power BSA's audience communication strategy and subsequent activity.

4.16 Establish a national advisory group

- We suggest that a national advisory group be established that contains a range of expertise and experience relevant to growing participation amongst low SES.
- We would suggest that all members of the national advisory group are people who directly create content for, or deliver content to low SES communities, rather than selecting experts who work strategically or theoretically.

¹³ Churn describes the proportion of participants who discontinue their engagement with a particular activity over time.

4.17 **Create a low SES user test group**

In addition to the recommendation to create a national advisory group, there would also be significant advantages to NSEW if a low SES user test group be developed.

- The composition of each test group might vary depending upon the specific context NSEW was operating within and the make-up of the delivery partners.
- These groups will need to be convened, participants selected and their input subsequently managed – so this will have a resource implication.

4.18 **Adopting best practice for future audience research**

- Clearly identify at the outset the questions that the research wishes to address.
- Only select events which contain significant numbers of people who fit the target research group(s).
- Use consistent questions, methodology and sampling framework where benchmarking is required to enable year on year comparisons.
- Collect postcode data to enable geo-demographic profiling.
- Compare population of areas hosting events with both the national profile and the profile of visitors overall to give context of the audience segments you might expect to attract.
- Ensure the survey is focussed and to the point.
- It is important to consider whether an incentive is required, and if one is, is it attractive to the target group?
- When working directly with specific groups (as opposed to fieldwork) it is beneficial to feedback research findings and importantly how this information has changed your approach and practices.