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Editor:
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bettertogether

Foreword

This second volume in the *Postgraduate Papers* series has been produced as part of the celebrations of ten years of Science Communication postgraduate programmes in the Faculty of Health and Applied Sciences, University of the West of England, Bristol.

Every year, some fifteen to twenty students undertake a Master's level project as part of their MSc studies. These papers represent just a small selection of the projects carried out between 2009 and 2013 but they persuasively demonstrate the wide range of subjects tackled by our students and the innovative research they conduct.

Bonnie Buckley, Jennifer Garrett and Melanie Davies looked at aspects of science communication in science centres and museums. Bonnie examined the motivations that lead people to be volunteers in science centres; Jennifer investigated how science centres can play a role in communicating environmental sustainability and Melanie explored how science centres can use a range of activities to sustain and develop creativity.

The Internet offers new modes and new routes for dialogue and science communication. Felicity Liggins, Mathieu Ranger and Robin Longdin undertook projects in this dynamic medium. Felicity explored attitudes to blogging in the UK Met Office, while Mathieu looked at the particular challenges faced by science bloggers and Robin investigated whether online interaction with scientists could positively affect school students' attitudes to science.

Amy Seakins, Maya Herbolzheimer and Sarah Venugopal's projects were all based in the lively and diverse world of festivals. Spanning the worlds of traditional and online communication, Amy considered how citizen science projects could make the most effective use of the media; Maya investigated the effectiveness of a Festival of Nature in engaging a wide range of attendees with nature conservation, while Sarah examined the relationship between arts and science at a science event embedded in an arts festival.

The final two papers, by Michal Jane Filtness and Alexander Brown defy grouping but clearly illustrate the variety of audiences our students address. Michal investigated researchers' views of the Pathways to Impact tool created by the UK Research Councils to increase the public impact of research, while Alexander evaluated the impact on school students' attitudes to science among young people who had undertaken work experience placements at a UK research council.

We want to congratulate those graduates whose research is included in this volume and thank them for the time and care they have taken in creating their contributions. Thanks should also go to the graduates' academic supervisors, who are the co-authors on these papers; in particular Dr Karen Bultitude and Dr Helen Featherstone, who are now based at other institutions. We would also like to thank the many organisations whose support made these projects possible.

We are honoured to share in our graduates' success and delighted to have this opportunity to open up their work to a wider audience. We wish all our graduates every success in their careers as science communicators.

Dr Ann Grand and Dr Clare Wilkinson (Programme Manager) April 2014

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Contents

An investigation of motivations for volunteering in three UK science centres and museums

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This paper is based on research carried out by Bonnie Buckley as part of her MSc in Science Communication.

1 Introduction

Formally volunteering for an organisation or group involves giving unpaid help that will benefit other people or the environment (Low *et al*., 2007). Motivations for volunteering are affected by personal attributes, social circumstances and the organisations' characteristics. The initial decision to volunteer can differ from the decision to sustain a continued commitment (Measham & Barnett, 2008). Volunteering provides opportunities for people to make a contribution to their communities and get something back (Institute for Volunteer Research, 2004).

1.1 Volunteering in science centres and museums

Over 60 organisations are members of the UK Association for Science and Discovery Centres (ASDC). Collectively, they receive over 20 million visitors annually, who have the opportunity to engage with and enjoy scientific cultural experiences (ASDC, 2012).

Volunteers make extraordinary contributions to science centres and museums. In 2008, the Association of Science-Technology Centers (ASTC) reported there were 77,870 volunteers in 171 institutions world-wide. In 2008, the number of volunteer hours contributed at 166 of these organisations totalled 2,640,983 (ASTC, 2008). Volunteers in science centres and museums can assist with educational programmes and outreach, consult on exhibition development, serve on boards of directors or fill other important roles. They help provide additional services to visitors at minimal cost (Davison, 2001).

Volunteers can offer their real-world experiences and put a personal face on scientific feats; a scientist volunteering for a 'meet the scientist' event has the knowledge and capability not only to share their work but also to enlighten visitors about how the work relates to previous and future research. Volunteers also model exploratory behaviour and science process skills in engaging and non-threatening ways (Grinell, 2003).

This research investigated motivations for volunteering at three science centres and museums in the UK: Thinktank Birmingham Science Museum, Science Oxford and At-Bristol. Volunteers at Thinktank help achieve the museum's goal of showing how science and technology are part of our lives and influence how we live. The volunteers are recruited by task, to match Thinktank's needs with volunteers' skills, knowledge and

experience (Thinktank, 2010). In addition to hosting exhibitions and hands-on activities, Science Oxford has an active public events programme. Volunteers assist in running these events, which include stargazing, adult evening lectures and special theme days (Science Oxford Live, 2012). Volunteering at At-Bristol includes corporate volunteering, internships, 'meet the expert' volunteers, and individual volunteers. The volunteers help support activities in school holidays, in the schools' programme and on special theme days (At-Bristol, 2012).

1.2 Aims & objectives

The aim of this project was to investigate motivations for volunteering from both the volunteers' and organisations' perspectives.

The objectives of the project were to:

- Gather motivations for why individuals choose to volunteer in science centres and museums.
- Collect information from the perspectives of staff members on why science centres and museums have volunteer programmes.
- Compare the results from volunteers and staff to identify similarities and differences in motivations.
- Identify any potential strengths, weaknesses and challenges that are caused as a result of similarities and differences in motivations.

2 Methods

2.1 Selection of science centres and museums

Organisations were identified using ASDC's 2012 member list. Those with an active volunteer programme were contacted via email; this resulted in three organisations agreeing to take part: Thinktank, Science Oxford and At-Bristol.

2.2 Data collection

The project used mixed methods. An online questionnaire was developed to gather quantitative data on individuals' motivations for volunteering. Veal (2006) recommends that previous research on the chosen topic should be referred to in designing a questionnaire; therefore, previous volunteer surveys and guidelines from the Institute of Volunteering Research (2004) were consulted. The questionnaire gathered demographic characteristics (e.g. age), volunteer behaviour and volunteer motivations, interest in STEM (science, technology, engineering and maths) subjects and previous visits to the organisation. After a pilot stage, the questionnaire's web link was sent to the primary contact at each organisation, who emailed the link to all active volunteers in the organisation.

To support a well-rounded understanding of the organisations' motivations for having a volunteer programme (Veal, 2006), semi-structured interviews were conducted with

staff members to gather qualitative data. The interviews began with a wide-ranging opening question, to encourage interviewees to begin talking about the volunteer programme (May, 2002). Subsequent questions included probes and prompts that guided interviewees to discuss how these motivations are or are not related to topics defined in previous general volunteering research (Gillham, 2005). The topics for the questions were:

- Motivations for contributing to local community
- Motivations for social interaction
- Motivations for opportunities for personal development
- Motivations for development and expansion of offerings
- Motivations for learning in STEM subject areas

Three staff members were interviewed at each organisation. These included the person responsible for managing the volunteer programme, a person who worked directly alongside volunteers on projects and activities, and one who did not directly work with volunteers but was aware of the volunteer programme. Together, these three staff members provided a representation of the motivations for having a volunteer programme. Each interview was audio recorded and transcribed for analysis.

2.3 Data Analysis

A parallel mixed analysis method was taken to analyse the data. Results from the attitude and behaviour sections of the questionnaire were used to identify motivating factors for volunteering. Comparisons were made between responses in demographic questions and attitudes and behaviour questions to identify any correlations.

The coding of the interview data involved three steps: identifying, organising, and interrelating themes (Osborne, 2008). Key, substantive points were identified and organised into categories, enabling the identification of significant themes.

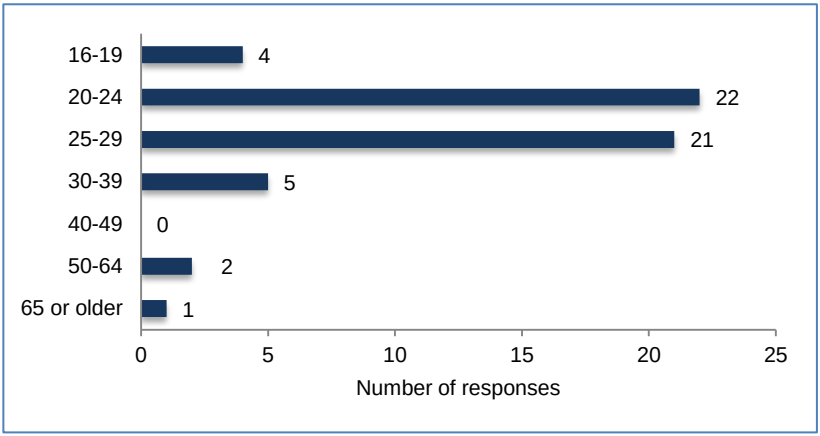
The final step was to compare the two data sets. Motivating factors for both volunteering and having a volunteer programme were found in the questionnaire and interview data. Comparisons were made to identify similarities and differences in motivating factors between the volunteers and the organisations.

3 Results

3.1 Volunteer characteristics

Fifty-five volunteers completed the survey, ranging in age from 16 to over 65 (see Figure 1). Volunteers were either interested or very interested in science and technology (98%, n=55) but most (76%) had either never visited the organisation or visited only once before volunteering.

Figure 1: Volunteers' age range



3.2 Volunteer motivations

Overall, 46 (84%) of respondents said that they sought to personally benefit from their volunteering experience. The greatest motivating factors identified included giving back to others in the community, participating in local events and activities, improving communication skills and interacting with others.

Volunteers were also asked an open-ended question to state more specifically why they chose to volunteer in science centres and museums. Volunteer 10 stated:

> *[I volunteer to] give back to the community. It sustains my interest in science and technology and helps me to inspire younger people in my role as a teacher.*

This interest in giving back to others in the community was a motivating factor for 89% of the volunteers. Similarly, 87% of the volunteers expressed an interest in being able to participate more in local events and activities. Improving communication skills was an additional motivating factor identified through the survey. Volunteer 44 stated:

> *I wanted to be involved in teaching science to the public as I believe science communication is important and this organisation allows me to accomplish this as a volunteer.*

The motivating factor identified by Volunteer 44 was reflected in the whole group: 88% of volunteers expressed an interest in improving communication skills and 95% of the volunteers sought to gain new skills through volunteering.

3.3 Staff interviews

Motivations for having a volunteer programme were identified through the nine staff interviews (see Table 1). The two greatest motivating factors for having a volunteer programme were the desire to enhance and add value to the visitor experience and to have the ability to expand offerings and do more with the available extra hands:

> *The original motivation was to bring in that experience and add that capacity to the organisation which means you can do all sorts of things* (Interviewee 8)

Table 1: Motivations for having a volunteer programme

Motivating factor	Example	Interviewees:
Enhance and add value to the visitor experience	*...being able to do something additional, something extra on top of what we would normally offer that benefits both the visitors and the volunteers and the staff...* (Interviewee 2)	9 of 9
Expand offerings / do more / have extra hands	*...to have capable help and more hands...* (Interviewee 6)	9 of 9
Engage with audiences in a different way	*...allowing people [the volunteers] to engage at a different stage in their life and in a different way with the museum...* (Interviewee 2)	8 of 9
Widen awareness of organisation	*...it creates a host of ambassadors for the organisation who can talk about it in a positive and knowledgeable way....* (Interviewee 9)	8 of 9
Build relationships and networks	*...it's a first step in building a relationship...we want people to stick around and help us to create something…* (Interviewee 9)	8 of 9
Embed the organisation more in the local community	*…giving people in our local communities the opportunities to interact with their local science museum and gain experience...* (Interviewee 1)	6 of 9

An added challenge in being able to expand offerings and increase engagement is the cost of running each additional event and having additional people. Being able to enhance the visitor experience and increase what is being offered but at a minimal cost was identified as a motivating factor for having a volunteer programme:

> *Having more people for no extra money. It sounds kind of harsh but we can maximise our impact and our engagement but at a small cost. We can engage with a lot more people and we can make their experience better and do it on a small budget.* (Interviewee 5)

In contrast, Interviewee 8 stressed that volunteers were not sought to replace paid employees, rather to add value and have a worthwhile experience. They provide something that the organisation is unable to do with paid staff alone. Interviewee 1 described this as:

> *I sort of visualise them as the cherry on the cake almost. The staff are the icing and they are just the extra, the cherry that enables us to give that extra 10%.*

4 Discussion and Conclusion

4.1 Motivating factors for volunteers

The greatest motivating factors for the volunteers were identified as:

- To interact with others
- To give back to others in the community
- To improve communication skills
- To participate in local events and activities

Overall, 84% of volunteers sought to personally benefit from volunteering. This was particularly shown in volunteers who were motivated to improve communication skills. These responses can be explained by the age characteristics of the volunteers surveyed: 47 volunteers (85%) were under 30. This reasoning is supported by Ockenden & Russell (2010), who explained that motivations to volunteer can be affected by the stage at which a person is in life. Younger people seek to focus on improving and gaining new skills to increase the potential for opportunities such as future employment.

The motivation to give back to others in the community was shown in 89% of the volunteers. This is supported by findings from The National Survey of Volunteering and Charitable Giving (2007), which observed that altruistic reasons led the decision to become involved as a volunteer. More specifically, the volunteers expressed a desire to share their interest in science and technology with others in the community and inspire younger audiences.

4.2 Motivating factors for organisations

The greatest motivating factors for the organisations were identified as:

- To enhance and add value to the visitor experience
- To expand offerings, do more and have extra hands
- To engage with audiences (specifically volunteers) in a different way
- To widen awareness of the organisation
- To build relationships and networks
- To embed the organisation more in the local community

The nine staff interviewees identified the two greatest motivating factors for having a volunteer programme as the desire to enhance and add value to the visitor experience

and to have the ability to expand offerings and do more with the available extra hands. Extra support from the volunteers supports additional activities, shows and more one-to-one interactions with visitors in exhibitions. More specifically, volunteers who are career scientists offer opportunities for the organisation to hold events such as 'meet the scientist', offering audiences a new perspective.

4.3 Comparing volunteers' and organisations' motivations

Volunteer and organisation motivations have the potential to complement one another. In general, volunteers are primarily motivated to improve communication, interact with others and give back to others in the community. By developing and supporting a volunteer programme, the organisations provide an opportunity for these volunteers to have an experience that fulfils their motivations. The presence of the volunteers allows the organisation to address its motivations for supporting the volunteer programme.

Within science centres and museums, volunteers have the opportunity to communicate with visitors, staff members and other volunteers through the activities, programming and events they are assisting with. Their added presence supports the organisations' motivation to have the capability to do more with the extra hands that are available. The organisation is also motivated to add value to and enhance the visitor experience. Volunteers add to this capacity by increasing the amount of possible programmes, events and day-to-day interactions, while adding their passion and interest in science and technology.

Another matching motivation between the organisation and the volunteer is the desire to do more for the community. The organisation would like to improve its status as a local community resource. It is motivated to have volunteers to do more within the community but also give additional ways in which members of the community can interact with their local science centre or museum. The volunteers seek to give back to others in the community. By getting involved in volunteering, they are given a platform from which they can share their knowledge of science and technology with the community. Together, they are able to embed the organisation within the community as a local resource.

Interviewee 9 expressed initial doubts regarding the volunteer programme and subsequent realisation of the opportunities for excitement, added enthusiasm and experience:

I have to say I was quite cautious when the whole volunteer programme started, I could easily see what was in it for us but I struggled to see why people would necessarily want to do it and I suppose in a way I think I'd forgotten why I'd initially joined the organisation because it was an exciting place to work where I got to meet a whole hoard of bizarre and interesting people and share the excitement of their day out and having fun. Once you manage to get yourself back there, you remember that when I first worked here I used to really look forward to a day on the floor. Even though it was really tiring and it was really hard work, 99% of people are having fun and you just get to feed off that in a way.

5 References

Association of Science-Technology Centers (2008) *Science Center Highlights*. Washington, DC: Association of Science-Technology Centers Incorporated.

At-Bristol (2012) *Volunteering and Internships*. Available from: http://www.at-bristol.org.uk/volunteer.html Accessed September 2012.

Davison, J. (2001) *Ready, Set, Go! Maximizing Success with Museum Volunteers*. In: Association of Science-Technology Centers (2001) *Dimensions*. Washington, DC: Association of Science-Technology Centers Incorporated.

Gillham, B. (2005) *Research Interviewing: The Range of Techniques*. Open University Press: Maidenhead.

Grinell, S. (2003) *A Place for Learning Science: Starting a Science Center and Keeping It Running*. Washington, DC: Association of Science-Technology Centers Incorporated.

Institute for Volunteering Research (2004). *Volunteering Impact Assessment Toolkit: A practical guide for measuring the impact of volunteering.* London: Institute for Volunteering Research.

Low, N., Butt, S., Ellis Paine, A. and Davis Smith, J. (2007) *Helping Out: A national survey of volunteering and charitable giving*, Cabinet Office: London

May, T. (2002) *Qualitative Research in Action*. London: SAGE Publications.

Measham, T.G., Barnett, G.B. (2008) Environmental Volunteering: motivations, modes and outcomes. *Australian Geographer*. 39 (4) 537.

Ockenden, N., Russell, J. (2010) The volunteer journey: people moving into and out of volunteering over their life course. *NCVO/VSSN Researching the Voluntary Sector Conference*. Leeds, 6 September 2010.

Osborne, J. (2008) Mixed Methods Research in the Social Sciences. *Best Practices in Quantitative Methods.* London: SAGE Publications.

Science Oxford Live (2012) *What's On*. Available from: http://www.scienceoxfordlive.com/whats-on Accessed March 2012.

Thinktank (2010). *Thinktank Birmingham Science Museum Volunteer Policy*. Available from: http://www.thinktank.ac/core/core_picker/download.asp?id=2652 [Accessed March 2012.

UK Association for Science and Discovery Centres (2012) *About Us*. Available from: http://sciencecentres.org.uk/about/ Accessed September 2012.

Veal, A.J. (2006) *Research Methods for Leisure and Tourism: A Practical Guide*. Essex: Pearson Education Limited.

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