Do science centres really engage in dialogue with the public?

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INTRODUCTION

The EU Commissioner for Research, Innovation and Science, Máire Geoghegan-Quinn, said in a statement in April 2012 regarding the Science in Dialogue Conference, that with an increasingly technological world the general public will have difficult choices to make in regards to how science and technology can help tackle our different societal changes. She envisages that through education, "the general public will be in a better position to understand and engage in debate on the most important science issues affecting society." The statement also expresses how surveys suggest that the public wants developments in technological research and innovation to be guided by the principles of trust, integrity and participation (Geoghegan-Quinn, 2012).

This investigation addresses the issue of dialogue between science and society in the context of science centres, to assess whether dialogue is present and whether it is being used in a way to achieve the aims set out through the steady development of public engagement (PE) dialogue strategies. The search was framed to assess whether a two-way flow of information is achieved between the 'science community' and members of the public. It sought to identify collaboration between the two whereby ideas are considered and shared, rather than a simple transmission of information. Despite fresh efforts to drive dialogue in science into the mainstream it is still something of a specialist activity (Sciencewise, 2012). The question this investigation posed to answer is whether science centres, known for their professionalism and sophistication in good science communication (Nepote, 2007) have sufficiently made the move in re-evaluating their role in public education and the representation of science (Pedretti, 2008).

We have used two science centres used as the focus for research: At-Bristol and Techniquest, in Cardiff. Qualitative research methods were used in the search for dialogue. The primary mode of research was observation of the exhibits and the centre in its entirety. Secondary research was carried out through close analysis of the brochures and website contents. The Public Engagement Triangle published by Science for All in 2010 (Science for All, 2010) was used in this research as a framework for the search for dialogue by acting as a reference of the level to which engagement was achieved. Three distinct levels of engagement were categorized, 'Transmit'; simple transmission of information from the science community to the public, 'Collaborate'; collaboration between the two parties through dialogue and 'Receive'; information received by the science community from the public.

RESULTS

There is a substantial unequal balance between the styles of exhibits present within the defined science centres. 295 exhibits in At-Bristol and 116 in Techniquest expressed traditional phenomenon-based or interactive 'hands-on' displays. Those characterized as 'critical' that animate the debate of current controversial issues, inviting visitors to partake actively in a two-way flow of engagement are distinctly fewer, with just 9 across both centres. The vast majority of the 9 exhibits were aimed at adults (78%). This is in contrast to the exhibits in the rest of the centre, which are predominantly aimed at children, suggesting that these 'critical' exhibits are not so suitable or easily catered towards children. In fact, At Bristol is strongly marketed as great for a 'family day out' and uses slogans such as "play and get hands-on with science", "watch explosive science shows". Similarly, in Techniquest's selection of brochures emphasis was resoundingly given to phenomenon-based experiences, with slogans used such as "What will wow you the most?". The focus on their website was again given to family oriented visits, with main events advertised being 'Toddler day' and 'Summer Term Programmes'. Ultimately no opportunities for 'dialogue' in terms of a two-way process of listening and interaction between the science 'community' and visitor over current contentious science topics were found in either websites or selection of brochures of each centre.

In terms of exhibits, a significant decreasing gradient from 'Information transmitted' to 'Evidence of collaboration' was found. All used the 'Transmit' tool; two exhibits allowed for visitor input, none gravitated towards 'Collaboration'. One of the two gave the opportunity to leave a comment and read other people's comments via a computer screen. And the other, through a comment board where a visitor can leave comments on a card to be answered by another visitor or staff member.

A measure of the accessibility of the science community through the exhibits was taken. It was found that there was no opportunity for a follow up discussion and no brochures were provided to this effect.

DISCUSSION

In the Government's 2004-2014 'Science and Innovation Investment Framework' (HM Treasury, 2004) aims were set out to move forward from public understanding of science (PUS) to facilitating PE. The aims were as follows: (a) government and scientists responding proactively to public priorities and concerns; (b) people having greater confidence in the benefits offered by science; (c) greater engagement with major issues facing society, such as climate change; and (d) careers in science becoming more attractive to both adults and children. Eight and a half years on, this investigation shows that each one of these aims were addressed through initiatives of both At-Bristol and Techniquest, however significantly greater emphasis was placed on achieving (b) and (d) than (a) and (c). The high proportion of exhibits aimed at children in both centres compared to those aimed at adults gives little chance for (a) and (c) to be achieved and reinforces the focus given to achieving (d).

The distinct lack of engagement surrounding contentious topics can also be related to the heavy reliance both centres hold on using computer displays and other interactive mechanisms. This provides substantial limitations for 'two-way aspects of listening and interaction' (Nepote, 2007) in a 'flow' of discussion; instead the collaboration is static with little or no mobility of ideas between 'the public' and the science community.

In two exhibits visitors are able to have an input, relying on visitors returning within a short time scale to receive an answer to their question or comment. From survey results obtained between 2008-2010 by the Scottish Government through a 'Science Centre Evaluation', an average of 63.5% of visits were first-time and only 18% were visitors returning within one year, the shortest timescale probed by the study. This suggests that the delayed response used as an alternative to face-to-face instant discussion does not allow any realistic opportunity for 'collaboration'; it is not achievable in this context. Upon return, visitors may find their comments unanswered, or answered by another visitor potentially incorrectly, either way failing to achieve the aim of tackling the 'crisis of trust' between the 'science community' and 'the public'.

CONCLUSION

We conclude that science centres do not really engage in dialogue with the public. In reference to the Public Engagement Triangle (Science for All, 2010) the study has concluded that collaboration in sharing and mediating ideas between science and society is never achieved in the science communication format that At-Bristol and Techniquest offer. The 'receive' tool allowing for visitor input is exercised as a rarity whilst most of the time the exhibits transmit information to the visitors.

Through marketing themselves as a place for a 'family fun day out' At-Bristol and Techniquest provoke an expected experience on part of the visitor. In doing so they serve their purpose in achieving the Government aims to build people's confidence in the benefits made by science and encourage adults and children to take careers in science. They are not perceived as a setting to engage in dialogue and discussion over societal concerns in science, which is evidenced in their distinct lack in mechanisms to respond proactively to public priorities and concerns or engaging with major issues facing society.

The move has not been made by Science Centres to renew their role in public education and the representation of science; instead reliance has been placed on the traditional method of simply 'transmitting' information. Resulting in a high proportion of traditional 'experimental and tutorial style' exhibits with respect to 'critical exhibitions'. The format and environment in which exhibitions are set simply does not lend itself to the 'dialogue' that such contentious topics require.

RECOMMENDATIONS

The duplicate role in which science centres are attempting but not achieving to balance alludes to the need for a re-evaluation:

Rather than combining a new contemporary aim of public engagement into a traditional format such as exhibitions, that do not meet the requirements, it is recommended to either:

- Provide a setting which hosts adult only events addressing contentious topics in contemporary science in an informal, informative and innovative context, enabling 'issues that matter' to be addressed in a collaborative manner (Dana Centre, 2012).

  Or

- Continue to inspire potential 'science professionals' and to promote confidence amongst the public to the advances in science, leaving 'dialogue' on contemporary science to a more suitable environment.

This conflicts with the current assumption by policy science and society frameworks that Science Centres, such as At-Bristol and Techniquest, through their current means, are ideal candidates to engage in 'dialogue' with the public over contemporary science issues.

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