

The Use of Social Marketing for Science Outreach Activities in Ireland



C H R I S T I N E D O M E G A N *

ABSTRACT

The recent trends in Irish society – the plastic bag levy, smoke-free public buildings and road safety advertisements – mean that social marketing is poised to provide alternatives to approaches that are no longer viable. The timing coincides with a shift in emphasis in government policy away from capital expenditure towards value-added outcomes associated with the knowledge society and innovation. This article explores the emerging field of science communication and outreach activities and the application of social marketing to the management and evaluation of such activities as a way forward.

Key Words: Social Marketing; Science Outreach Activities.

INTRODUCTION

Social Marketing is, broadly speaking, the application of marketing principles to social issues and is best known for its use in campaigns related to public health and the environment. Successful programmes dealing with obesity, tobacco consumption, family planning, safe sex, recycling, waste management and water purity are the more common applications cited (Andreasen, 2002; Kotler et al., 2002; Hastings, 2003). It is widely accepted that many social

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problems and concerns have underlying behavioural causes. As Social Marketing is about influencing behavioural outcomes, recent years have witnessed dramatic growth in the use and application of Social Marketing (Gordon et al., 2006). Both commercial and non-profit organisations alike are undertaking Social Marketing, especially in social issues where educational and legal interventions have failed (Diamond and Oppenheim, 2004).

A phenomenon not commonly associated with Social Marketing is the growing number of science programmes aimed at the general public. These scientific initiatives are established to drive our knowledge-based society and represent a major investment of resources (Beetlestone et al., 1998; Edwards, 2004; McCauley et al., 2006). Better known as Science Outreach Activities, because they are charged with raising the public awareness of science, they allow children, teachers and parents to experience science in a fun, hands-on and exciting way and to stimulate their interest and participation in science as career options and research avenues. They include, for example, the Alimentary Pharmabiotic Centre in UCC; Ready, Steady Bio and the Digital Enterprise Research Institute, both in NUI, Galway; Calmast, Waterford IT; the Pfizer Science Bus, DCU; and PharmaChemical Ireland.

Behind this worldwide science movement is an accepted, implicit assumption – a seamless link between science interest, enthusiasm, science literacy levels, science careers, and economic and social prosperity (Layton et al., 1993; Beetlestone et al., 1998). Nowhere is this better reflected than in Ireland, where science ‘is vital to our economic and social progress’ (DETE, 2006: 3). Being science-driven is clearly seen as the foundation of Ireland’s future if the Celtic Tiger is to sustain its position of the third highest GNP (Gross National Product) per person in the world, behind the United States and New Zealand (Economist Intelligence Unit, 2006). To this end, the Irish government launched several science initiatives, some include the re-introduction of science at primary level (see <<http://www.primaryscience.ie>>), increased resources and teacher training (see <<http://www.science.ie>>), the establishment of the Science Foundation of Ireland (see <<http://www.sfi.ie>>) and the promotion of science amongst the public through Discover

Science & Engineering (see <<http://www.forfas.ie>>). The recently announced Strategy for Science, Technology and Innovation 2006–2013 is being further supported with €3.8 billion (DETE, 2006). By any standards, this represents impressive funding, investment and resources.

The government is not the only one to respond to the science challenge in Ireland. Universities offer science programmes and open science days through their science faculties (see <<http://www.universityscience.ie>>). Multinational organisations, originally attracted to Ireland for its tax benefits and now needing Ireland's knowledgeable workforce, participate in science awareness, promotion and initiatives. For example, Medtronic, Boston Scientific and HP champion the annual Science and Technology Festival (see <<http://www.galwayscience.ie>>) and Pfizer sponsor the Pfizer Science Bus delivering science to Irish schools (see <<http://www.dcu.ie/sciencebus>>). Smaller companies, such as Mad Science, commercially sell science kits, science birthday parties and summer workshops (see <<http://www.madscience.org>>).

The application of Social Marketing to issues that concern societies, such as smoking, drink driving, exercise for young children, teenage drinking and leprosy, suggests perhaps it could be of relevance to Science Outreach (Wong, 2002; Long and Murphy, 2005). Can the concepts inherent in Social Marketing be applied to a field such as Science Outreach? Are there valuable insights to be had from Social Marketing for Science Outreach design, management and evaluation? Can the Social Marketing model deal with a diverse topic like Science Outreach? Do unique issues emerge? Would the inclusion of Social Marketing in Science Outreach thinking deepen our understanding of the role of science in society?

The purpose of this paper is to examine the use of Social Marketing for the management of Science Outreach activities through case study research. Specifically, this paper investigates what aspects of Social Marketing are relevant for Science Outreach activities in Ireland. It seeks to inform how Social Marketing relates to Science Outreach, culminating in an assessment of how Science Outreach design, planning and management could be enhanced by the use of a Social Marketing framework.

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SOCIAL MARKETING DEFINED

Theoretically, there is no generalised definition of Social Marketing (McDermott et al., 2005). The term Social Marketing first appeared in a pioneering article, 'Social Marketing: An Approach to Planned Social Change', co-authored by Philip Kotler and Gerald Zaltman in 1971 in the *Journal of Marketing*. In the 1970s, Social Marketing was about selling 'ideas'. With the nature of Social Marketing being 'to sell brotherhood the way we sell soap' (Wiebe, 1951–52: 679), these early beginnings for Social Marketing are now referred to as 'tell and sell' marketing (NSMC, 2006). This initial conceptualisation of Social Marketing defined itself based upon discreet, economic marketing transactions. Like commercial marketing then, it focused upon a 'market to' the consumer's managerial perspective. On the ground, this inevitably resulted in Social Marketing in its infancy being strongly concerned with the communication of a message.

For this reason, non-marketing professionals tended to confuse Social Marketing with social communication. Social communication does not use the principles of marketing. As Sargeant (2005: 184) makes the point, 'the social marketer is concerned not only with the communication of a message; she must also attempt to make the adoption of a behavioural change relatively easy to achieve.' In the past, Social Marketing has also been wrongly defined as social propaganda and education (O'Shaughnessy, 1996). Despite this nebulous beginning, most, but not all, welcomed the expansion of economic transaction marketing into non-traditional and non-commercial areas such as public health and family planning (Kotler and Levy, 1969; Luck, 1969).

The conceptually modern view of Social Marketing in the 21st century has matured and now delineates its domain around the exchange process of voluntary behavioural change. Recent debates within the literature (Andreasen, 1995, 2002; Kotler et al., 2002; Hastings, 2003) confirm the conceptual movement towards the 'market with' relational approach (Lusch and Vargo, 2006). Currently, the three most accepted meanings of Social Marketing manifesting this modern view have been advanced by Kotler et al. (2002: 5), Andreasen (2002: 296) and Hastings (2003: 12).

Kotler's view is that: 'Social Marketing is the use of marketing principles and techniques to influence a target audience to voluntarily accept, reject, modify, or abandon a behaviour for the benefit of individuals, groups, or society as a whole' (2005: 5). Andreasen perceives Social Marketing as 'the application of commercial marketing technologies to the analysis, planning, execution and evaluation of programs designed to influence the voluntary behaviour of target audiences in order to improve their personal welfare and that of their society' (2002: 296) and Hastings regards 'Social Marketing's most fundamental feature is that it takes learning from commerce ... such as consumer orientation, mutually beneficial exchange, the need to focus on behaviour change and address the context as well as the individual' (2003: 12).

These definitions have important bearings upon Science Outreach. The very core of Social Marketing – voluntary behavioural change beyond the individual and the surrounding societal context – implicitly and explicitly embraces the notion of Science Outreach. Each of these are now elaborated upon, and illustrated against Science Outreach practice in Ireland to demonstrate the relevance of Social Marketing for Science Outreach activities.

Beyond Individual Exchange to Complex Multiple Exchanges

One characteristic agreed by all in the Social Marketing literature is that the behavioural change occurs at both individual and society level (Lawther and Lowry, 1995; Hastings et al., 2000). Levy and Zaltman (1975) identify three dimensions in society that are affected by the change sought in Social Marketing campaigns: micro-level, group-level and macro-level. They capture this distinctive trait of Social Marketing in their examination of the impact of Social Marketing campaigns as displayed in Figure 1.

Like commercial marketing, the unit of analysis in Social Marketing begins at the micro-level of the customer. Social Marketing also pays attention to the next level of analysis or impact, the inter-organisational relationships of varying content, duration and strength (Ford et al., 2003). This has to be managed with the micro or customer unit. As a sign of this, the term 'community-based Social Marketing' now exists. However, Social Marketing, while incorporating both these levels of analysis, adds yet a third

108 *Use of Social Marketing for Science Outreach Activities***Figure 1: Types of Social Change, by Time and Level of Society**

Change	Micro-Level (Individual)	Group-Level (Group/Organisation)	Macro-Level (Society)
Short-term	<i>Behaviour change</i>	<i>Changes in norms/ administrative change</i>	<i>Policy change</i>
Example	Attendance at stop-smoking clinic.	Removal of tobacco advertising from outside a school.	Banning of all forms of tobacco marketing.
Long-term	<i>Lifestyle change</i>	<i>Organisational change</i>	<i>Socio-cultural evolution</i>
Example	Smoking cessation.	Deter retailers from selling cigarettes to minors.	Eradication of all tobacco-related disease.

level or unit of analysis, that of the whole system – a macro, society level, constituting those who control the social context influencing the other two units (Brenkert, 2002). This third social context level signals a further complexity for Social Marketing managers not normally seen by commercial managers. This is attributable to the fact that individuals influence and are influenced by those surrounding them, thereby requiring this three-tiered analysis approach to the exchange process. Hastings and Saren (2003: 315) believe this three-unit impact at different levels is Social Marketing's biggest contribution, bridging the 'gap between the corporate sector and public welfare' and understanding both worlds.

This multiple impact results in Social Marketing having an extensive constellation of stakeholders and relationships to satisfy. Social Marketing stresses relationships beyond the consumer into the broader market place, including suppliers, distributors and supporting firms, and extending to local communities, regional bodies and government. The relationships are simultaneously active at all levels with the customers, communities and policy-makers to achieve synergy between the multiple change agents and bring about the desired behavioural change (NSMC, 2006). Bagozzi (1975: 35) refers to this co-creation of value as a complex marketing exchange,

where more than three parties are involved in a network of relationships and there is not 'the simple quid pro quo notion characteristic of most economic exchanges'.

In a very real sense, Social Marketing is as much about the social as the economic relationships of a society-wide network (Penaloza and Venkatesh, 2006). However, this is not to deny the significant economic impact arising from a social exchange such as the elimination of smoking and the positive health effects for individuals and society. These relations are formal and informal. Based upon a customer focus that considers the self-interested perspective of a target segment, Social Marketing has to successfully manage a multitude of varied, self-interested target audiences. Communications and interactions are extensive and vital to the proper function of the relations (Covellio et al., 1997). Here, communications becomes a two-way process and the role of the customer shifts from being passive to active in the exchange. Tangible and intangible elements compliment either the product or the service, all resulting in closer relationships (Covellio et al., 2001; Brady et al., 2002; Brookes et al., 2004; Brodie et al., 2007). Relationships at multiple levels are one defining characteristic. This requires face-to-face personal formal and informal communication with individualised, active customers to facilitate extensive interactions and relationships between employees and customers (Covellio et al., 2002). This empowers the customers to be highly participative in all aspects of the consumption process, giving rise to the co-creation of values and benefits between the organisation and customer.

Social Marketing is the co-creation of complex social and economic benefits and values 'with' customers among and throughout an entire community network of relationships. It is not a firm-level network – it works up-, down- and in-stream, throughout an entire holistic system of relationships. It is a network of deep collaboration, problem-solving and passion entirely centered around, among and concerned with, the real and true needs of the customer (Smith, 2000, 2006).

Another facet that Social Marketing's multiple concurrent co-creation of benefits has to contend with is the complexity of the relationships reflected in the continuum of self-interested stakeholders that vary from customer segments that 'behave as we wish'

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to 'resistant to behave as we wish' to programme designers and policy-makers who fund such programmes (Rothschild et al., 2006: 1220). In a free society, the customer has the choice to refuse to change behaviour and maintain the current undesirable behaviour. The product or intervention from the social marketer must deliver greater immediate benefit and greater perceived value than the alternative behavioural choices. This is vastly different to commercial marketing where the main source of greater benefit or value comes from other organisations and businesses who offer similar goods and services (Szydlowski et al., 2005). The self-interest of customers/target markets requires the social marketer to work harder, faster, deeper and more extensively in understanding the motivations of the target customers and designing a market offering or intervention to appeal to them. As customers become more individualised, the need to understand and invest in motivations, commitment and trust rise (Hjelmar, 2005; Hastings, 2006).

Self-interest and conflict also derives from the other multiple active and participant stakeholders. In this guise, it relates to the goals of the Social Marketing strategy. Commercial marketing is predominately driven by the profit goal, compared with the practice of Social Marketing, where the aim is societal value. The self-interest in commercial marketing, while present in Social Marketing, functions alongside social aims. The social involvement of customers and organisations is more than a supporting condition in Social Marketing. The social component adds worth to the economic aspect and is valued in its own right (McKee and Wang, 2005).

Yet another implication of behavioural change for many exchange parties is captured by the notion of time. In Social Marketing, lengthy time periods are needed to perform what is planned and for future planning (Laczniak et al., 1979). This is especially true when large-scale behavioural change is sought, which in turn may require a change in beliefs or attitudes and when one is building a community of relationships. The best Social Marketing programmes advocate three to ten years duration, with the preference being for 10+ years in health promotion programmes such as AIDS programmes. This suggests that for networks of relationships, truly complex in nature, straddling large numbers of

disparate parties, requiring dynamic flows of communication and extensive interactions at numerous levels, within and between organisations, a longer time-frame (ten years) is indicative of a 'market with' approach to marketing. Long-term relationships are 'expensive, time-consuming and complex' to develop and manage according to Haytko (2004). Lusch and Vargo (2006) offer further insight into why we may need to lengthen our time-frame for some contemporary marketing practices – adaptive learning and flexibility are necessary to achieve competitive advantage and time is one of the critical elements.

Beyond the Marketplace to Societal and Environmental Influences

Exchange behaviour and relationships are socially, as well as economically, determined (Maibach and Cotton, 1995). Niblett (2005) sees partnerships as the key to Social Marketing, as they generally provide the needed infrastructure for the marketing mix, making for efficient use of limited resources and solving many capital dilemmas non-profit companies suffer from. Partnerships, like the levels of exchange, are multiple and occur simultaneously at five levels: (a) intrapersonal/individual, (b) interpersonal – where family, friends and peers ensure social support, (c) institutional/organisational, (d) community – through social networks and norms at a local or regional level, thereby once removed or more distant from the family/friends platform, and finally (e) public policy (Morgan and Hunt, 1994; McLeroy et al., 1988). This reinforces the concept of a network of relationships 'with, among and throughout' an entire community, and not just confined to any one level. Partnerships play this fundamental role in Social Marketing because they enable the vast number of parties in the holistic exchange system to work downstream, upstream and in-stream.

Downstream relates to aspects of Social Marketing that are only concerned with influencing the target audience, the end consumer or individuals. Downstream partners concentrate upon creating and distributing the interventions. Upstream Social Marketing examines the function of organisations, events and their consequences on a given behaviour for the individual and society. Upstream behaviour is aimed at altering the environment and policies affecting the target

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audience to encourage and support the required individual behaviour change (Andreasen and Herzberg, 2005). Goldberg (1995: 361) encourages social marketers to take both upstream and downstream partnerships into account because 'these perspectives are likely to be complementary and even interactive', and the more partners to a Social Marketing campaign, the more effective the campaign tends to be and the greater the collective value of the contributions.

The final dimension of Social Marketing, of importance to Science Outreach work, is evaluation. Evaluation, like partnerships, is synonymous with Social Marketing. This is a consistent theme from Kotler and Zaltman (1971) to Hastings (2006). With the large number of differing individuals and groups, with differing needs and wants, evidence-based data and information is central to any successful Social Marketing performance. But it is more than information, more than generating data and intelligence. Evaluation aims to guide actionable insights using considered judgement. It is because of this considered insight that Weinreich (1999) contends evaluation is the cornerstone of Social Marketing.

Social Marketing evaluation falls into three camps. Firstly, there is formative evaluation – an information gathering process at the beginning of the exchange and intervention to shape and mould the programme/campaign to the self-interested needs of the up- and downstream target audiences. To this end, audience research, message and intervention testing, new product development and counter-competitive behaviour research form part of the constant information cycle used to shape Social Marketing strategy. Formative evaluation integrates effective research into the development of programmes, maximising benefits and the value of the exchange process for all parties. Formative evaluation is one of the essential elements of Social Marketing. Why is this so? It is because Social Marketing campaigns, by definition, only begin *after* the target audience has been heavily researched and the voice of the consumer truly heard and understood (Sargeant, 2005). As well as this, poor or unavailable secondary data sources in Social Marketing further fuels the evaluation/information drive towards knowing research (Bloom and Novelli, 1891). Also, it is more difficult for social marketers to obtain valid measures of salient variables than it is for commercial marketers and, as a result, multiple qualitative

and quantitative methods are consistently utilised (Goldberg, 1995). The result of this rigorous up-front 'knowing' information cycle, feeding into, shaping and informing a community of partnerships, is an ability to adapt and learn from all the exchange parties in their environments.

Secondly it is an outcome or impact study where indicators can be used for measuring outcomes, financial and non-financial. Outcomes are improved in Social Marketing because it is evidence-based, on what works in relation to individual motivations and interventions (SMNEC, 2003). Outcome measurements tend to be target audience-focused and include changes in behaviour, behavioural intent, belief and knowledge.

Finally, there is process evaluation to measure executional elements, that is, how well the programme was conducted according to the plan (Kotler et al., 2002). Expected measures include reach and frequency, media coverage and costs, as in TM (Transaction Marketing). Policy changes, partnership contributions and funding sources are the other elements listed by Kotler et al. (2002) as being more specific to Social Marketing.

CASE STUDY

Beyond Individual Exchange to Complex Multiple Exchanges

Under the auspice of Science Foundation Ireland (SFI), the Centres for Science, Engineering and Technology (CSETs) undertake science outreach and communication activities. REMEDI (see <<http://www.remedi.ie>>) is one such CSET set up in 2003 through a €14.9 million award over five years. REMEDI conducts basic and applied research in regenerative medicine, an emerging field that combines the technologies of gene therapy and adult stem cell therapy. REMEDI outreach programmes are science initiatives to create awareness of and promote science to school children, teachers, parents, the local community and general public through interventions (e.g. forensic crime-solving workshops for school children, microscope training for teachers, and hands-on cell experiments). REMEDI's target audiences are (a) the general public, (b) students at primary, secondary and third-level education, (c) teachers, (d) parents, (e) industry and finally (f) policy-makers.

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The Digital Enterprise Research Institute (DERI) is also funded by SFI with a €12 million grant over five years (see <<http://www.deri.ie>>). DERI researches the next generation of the World Wide Web – the Semantic Web. It focuses upon software that allows the Internet to become a platform where organisations and individuals can easily communicate with each other, to carry out commercial activities and provide value-added services. Like REMEDI, DERI pursues outreach initiatives, targeted at primary and secondary school children, their teachers and parents along with the general public with particular emphasis on community and the voluntary sector, and aims to improve the quality of life of Ireland's people ranging from active retirement groups, the local Brazilian immigrant population and asylum-seekers to primary and secondary schools through the usage of web services. DERI has the same portfolio of customers: school pupils, their teachers and parents. However DERI is different to REMEDI in that DERI has a more local community base to its social relationships. DERI caters for specific groups of children and parents that are hard to reach or disadvantaged, such as asylum-seekers.

Another example of Social Marketing's three levels of analysis in Science Outreach is visible in the 'Our Universe' campaign by PharmaChemical Ireland. With sixteen of the top twenty pharmaceutical and chemicals companies in the world currently based in Ireland, PharmaChemical Ireland was established within the Irish Business and Employers Confederation (IBEC) in 1994 to expand and develop the sectors' business activities, thus enabling it to maintain international competitiveness and to improve the industry's communications with all sectors of society. In particular, the Our Universe campaign, established in 1995, provides business volunteers to go to local schools to deliver a range of activity-based enterprise and science programmes for young people aged five to eighteen years in partnership with the class teacher. The programmes are aimed at encouraging young people to make the successful transition from education into the science workplace. Table 1 shows how PharmaChemical Ireland's 'Our Universe' campaign influences groups and societies as well as individuals.

The campaign allows members to be 'caring and open to one another and to people in the community' outside of PharmaChemical

Table 1: Exchanges Beyond the Individual Consumer – ‘Our Universe’ Campaign

Students	Students’ awareness/interest in science is directly affected by the campaign.
Teachers	Teachers have praised the campaign and shown an increased awareness of the initiative.
Parents	Parents have given positive feedback to volunteers and shown an increased awareness of the initiative.
Community	The initiative has strengthened relationships with local school and community and increased the community’s awareness of science and its value to society.
Society	The campaign has contributed to a nationwide effort to have science introduced as an obligatory subject at primary school level.

Ireland. ‘Industry benefits because the campaigns will hopefully lead to an increased supply of employees. The volunteers have a good time and that creates employee satisfaction. Schools benefit because the science campaign takes pressure off teachers and also creates further teacher resources. The students benefit because, in the modern world, to have a firm science grounding is essential’ (Corry, 2006: 70).

These outreach science initiatives capture the essence of Social Marketing – the central role of community networks and interaction in value creation and exchange for voluntary behaviour change. At the micro-level, primary and secondary school children, their teachers and their parents constitute different target audiences, with different social and economic needs. At the macro-level, relationships between community groups and regional bodies facilitate the exchange process, with national agents at the top end of the value co-creation chain. These relationships have one aim – a change in behaviour – the uptake of science as a school subject and career option.

In testimony to the co-existence of both social and economic goals, Brendan Smith, DERI’s Education and Community Outreach Officer, explains, ‘my role is basically to explain how new web technologies can dramatically improve the lives of schools, communities and society generally’ (Domegan and Corry, 2006). REMEDI

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goals for its outreach are the following: (1) to ignite and sustain second-level students' interest in science, (2) to promote a positive attitude in the general public towards science, careers in science and technology, and to facilitate useful debate on current scientific and public interest issues and (3) to address the socio-economic impact and the public policy concerns of policy-makers, arising from research in the new medical regenerative technologies.

PharmaChemical Ireland's chairman, Pdraig Somers of Swiss-based pharmaceutical company Helsinn-Birex, explains, 'the supply of highly skilled and motivated staff is vital if we are to secure existing investment and attract new companies to the country. The focus on promoting science at both primary and secondary schools must continue' (Corry, 2006: 3). The goal of the 'Our Universe' campaign is 'to get people interested [in] and knowledgeable about science in the short-term, leading to the uptake of science subjects and careers in science in the long run. If we can send volunteers to the same schools year after year, this will help the students get a better understanding (of science) and more of an idea and interest in science' (Corry, 2006: 68).

To successfully serve such a large number of target audiences and achieve a behavioural change, all three Science Outreach initiatives are approached from a long-term perspective. Both REMEDI and DERI have an initial five-year time-frame. As a result of this long-term perspective, REMEDI has been able to adjust its plans and put a two-year package together for the primary schools. This was not an original REMEDI objective but on foot of (a) changes in the local environment where an interactive centre for primary schools closed and (b) work experience with secondary schools that showed children needed to have more interest in science before secondary school, REMEDI now include children aged seven to twelve years. The 'Our Universe' campaign has been running for four years and is it planned for it to run for the foreseeable future.

BEYOND THE MARKETPLACE TO SOCIETAL AND ENVIRONMENTAL INFLUENCES

In relation to partnerships, all three of the Science Outreach campaigns consciously form and participate in extensive partnership building. DERI's concentration on community groups has required it

to form strong co-operative alliances locally with Galway City Council, Galway County Council, Galway Education Centre, Galway Centre for Independent Living, the Health Services Executive and local schools. There is informal and formal, social and business communication, together with extensive networking. This is such a vital part of the DERI offering that DERI refers to them as 'Strategic Partnerships' and maintains DERI projects only happen because of the partnerships between a wide range of important local stakeholders because 'everything is a partnership' (Domegan and Corry, 2006).

DERI sees its role as one of 'adding value' to the existing infrastructure in the region by utilising partners and their resources (e.g. sports halls to deliver its offerings). This approach of adding value to partnerships is a classic Social Marketing scenario where DERI's lack of resources is overcome by accessing and enhancing partners' infrastructure. For example, many of DERI's partners act as a distribution channel for its services, and DERI, by operating at off-peak hours (e.g. evening time), enhances the operational efficiency of the partners' resources.

Both DERI and REMEDI work with upstream partnerships, including city and county councils and Galway Educational Centre – they have the ability to change the social environment (e.g. free access to technologies in public libraries). They also actively partner with other science-orientated state agencies and other third-level institutions to affect the social environment at micro- and macro-levels in which science initiatives are offered. This work centres on information about interventions, what works and how the different stakeholders respond and essentially, is coalition-building based upon problem-solving.

The concept of up- and downstream partnerships is evident in the 'Our Universe' project too. Altering the social environment to 'facilitate' students to take up science subjects is called for by the campaign where

[A] revised syllabus has occurred but it's a case of a lot done a lot more to do, we are trying to introduce exciting material, interesting material to the syllabus such as DNA tracing, fingerprinting, blood patterns and gunshot residue. We would hope to give teachers these materials handed on a plate (Corry, 2006: 81).

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To encourage students to study science, 'subjects such as History, Geography, Art and the Languages all offer the student the chance to gain marks before they sit exams, in the form of orals or logs. Science doesn't, so other subjects have an advantage over science. This needs to change' (Corry, 2006: 81).

All three Science Outreach campaigns conduct evaluations. The 'Our Universe' campaign is adapted on a regular basis depending on what has been learned from previous campaigns. 'We do adapt programmes, a lot of the programmes originate in the States so we have localised them to suit Irish students and the Irish curriculum' (Corry, 2006: 77). A two-stage approach was adopted in order to evaluate the effectiveness of the 'Our Universe' programme. Both quantitative (pre- and post-programme surveys) and qualitative (focus groups) were employed pre-and post-programme. The questionnaire contained six questions. The first five questions focused on the five modules of the programme with one question for each module. The last question asked students to choose a job they would like when they got older. Four specific options were given (including scientist) with a fifth option being 'other' or a job not mentioned in the first four categories. At the Junior Achievement training session for participating teachers and volunteers, teachers were instructed to distribute the questionnaires to their students before the business volunteers made their first visit to the classroom, and again after the volunteers had completed their final visit.

As well as the pre/post-programme surveys, the Our Universe staff conducts focus groups with participating teachers and business volunteers who had delivered the programme. The format involves the group discussing all five modules in terms of content and materials, training for the programme, as well as the support provided by staff. The programme is then modified according to problems and suggestions identified from the evaluation process. For example, in a recent evaluation process, teachers and volunteers deemed Module 3 (the environment) a success although more detailed information might be necessary in order to really challenge students (Corry, 2006: 92).

REMEDI and DERI conduct impact studies as well, in the form of customer satisfaction surveys with children, teachers and partners. DERI also conducts extensive formative evaluations through

consultations with stakeholders and consumers prior to programme development. For example, to understand how different users of the Internet wanted to improve the quality of life for the local Brazilian immigrant community in Gort discussions were held with local Brazilians in the area, alongside discussions with DERI's partner, the VEC, as to their needs from such an offering.

CONCLUSION

'*Science is Fun!*' and '*Study Science*' are the new mantras being added to the already familiar '*Fasten your seat belt*', '*Don't drink and drive*' and '*Reduce, Reuse, Recycle*'. These are popular themes requiring a voluntary behavioural change of benefit to the individual and society. They go to the very heart of Social Marketing. With Social Marketing an increasingly important development in the field of marketing this paper questioned what aspects of Social Marketing could be applied to the management of Science Outreach activities in Ireland.

The first obvious answer lies in Social Marketing putting the behavioural-changing individual at the centre of the process and orchestrating a society-wide network of relationships and partnerships to achieve such goals, using extensive research- and evidence-based information and evaluation (see Table 2). In this manner, Social Marketing delivers innovative insights into the social and economic exchange process that underlies Science Outreach programmes.

Table 2: Social Marketing: Implications for Science Outreach Activities

Issues	Science Outreach Activities
Beyond individual exchange to complex multiple exchanges	Adds a third layer: the community/society aspect. Audience-centred and all stakeholders driven. Social and consumption behaviour. Expands to longer time-frame, allowing for adaptive learning and flexibility.
Beyond the marketplace to societal and environmental influences	Introduces partnerships upstream notion. Introduces evaluation for insight and actioned judgement to support decision-making.

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Second and interestingly, Social Marketing, like Science Outreach, is heavily informed by diverse, complex, multi-disciplinary fields such as psychology, community behaviour, education, communication, health promotion, sociology and science. Hence, Social Marketing deepens our understanding of networks, of relationships, and of complex economic and social exchanges. In doing so it offers the potential to enrich our theories about Science Outreach and how they operate, about science and society and how they occur and so expand the horizons of the existing Science Outreach agenda.

The less obvious answer as to how the Science Outreach could or should be refined by Social Marketing is presented in the form of partnerships and evaluation, both of pivotal importance to an extensive network of community relationships. Management resources, assets and investments need to be directed towards collaboration at all levels within a society and within the network itself. This requires management passion and an ability to solve complex problems and exchanges. In turn, constant information and a flexible adaptive learning outlook are needed, if organisations are to perform and dominate their chosen markets. Partnerships and evaluation also draw the environment within which marketing occurs within the equation – a factor that is central to the performance/practice dimension. In this manner, Social Marketing can deepen our understanding of how the co-creation of value, related to social and environmental, as well as commercial, motivations, happens in the context of Science Outreach.

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