

QUESTACON INDIGENOUS PROGRAMS

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ABSTRACT

Questacon's Outreach programs aim to take the excitement of science and technology beyond Questacon's galleries in Canberra and make it accessible to people in the regional, rural and remote areas of Australia. Questacon's Indigenous Outreach programs focus on reaching Australia's Indigenous people, particularly those living in remote communities. To date the Shell Questacon Science Circus has been the main vehicle for reaching these communities. During the last four years a reflective evaluation process has taken place to develop an appropriate approach to the complex task of communicating with the diverse range of different cultures that make up the Indigenous population of Australia. Questacon is confident that it now has some firm operating principles in place to guide the approach taken when communicating with people from different cultural, language and social backgrounds. A longer term study into the on-going impact of the programs is required and this is being built into new projects.

INDEX TERMS

Indigenous Australians, Diversity, Cross-cultural

INTRODUCTION

Questacon has a significant Outreach program which delivers science awareness shows and workshops in schools and communities across Australia. These shows and workshops highlight basic science principles, cutting edge technology, mathematics, careers and opportunities for entrepreneurship. The audiences include very young children through to adults in, mainly, regional and rural areas.

Questacon's Indigenous Outreach programs focus on Indigenous people in regional and remote communities and respond to the following identified issues:

- Indigenous Australians are significantly under represented in science, technology and related fields in Australia. While 2.2% of the overall population is Indigenous, in the 15 – 24 years age range 3.0% are Indigenous. However, only 1.2% of students enrolled in Higher Education courses are Indigenous. (ABS, 2001)
- Indigenous students represent only 0.6% of those enrolled in science or science related courses at Australian universities. (DEST, 2003)
- Many Indigenous people live in remote communities with limited access to science programs.
- Many Indigenous people face cultural, social, language, geographic or economic barriers to becoming involved in science and technology education or training.
- Science and technology is often seen as irrelevant by Indigenous people in the light of strong, traditional Indigenous knowledge.

The study, Black and White Science (McLisky C, and Day D, University of Sydney, 2004), found '... complex cultural, social, economic and institutional issues influencing under-representation [by Indigenous students in the fields of science and technology] especially the prime importance of Indigenous knowledge to communities and the apparent lack of relevance of Science and Technology to Indigenous people.'

The introduction of western culture, language and economics has created dislocation and fragmentation in Indigenous Australian communities and much of the rich diversity of traditional culture has been lost. However there are many Indigenous people, particularly those living in the very remote areas of the country, who still have a close connection with their land, language and cultural

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practices. They also face serious problems in terms of health, alcohol and other substance abuse, unemployment, social fragmentation and a range of other issues related to their geographic isolation.

In the past, this context has raised important questions in the minds of the Questacon presenters visiting the communities. There were questions related to feeling they were imposing modern science on a people who had a sophisticated understanding of their environment and a deeply held belief system to match that understanding. Should we challenge an understanding based on thousands of years of experience? Is Indigenous knowledge a form of science? Is there an Indigenous science or is science universal?

Other questions were more practical. The challenges facing many communities were so complex and so confronting – especially for those presenters with limited experience beyond middle class Sydney. How could visiting these remote communities for a couple of days and presenting some fun science activities possibly contribute to helping the serious social and health issues? What was the point of trying to get kids excited about learning science when it appeared that the future for most of them would be a continuation of the cycle of destructive behaviour related to alcohol and other substance abuse, poverty and isolation with little likelihood of studying beyond junior high school?

Such questions challenged the presenters individually and Questacon as an organization to be clear about what the programs were aiming to achieve. The stated aims of Questacon's Indigenous Outreach programs are to:

- Create greater awareness of the relevance of science and technology in communities
- Engage students in the process of scientific thought through the use of everyday materials
- Make science concepts accessible to students
- Provide resources and ideas for teachers to use in the classroom

In light of the response of many Indigenous communities to Questacon programs, and with the input of teachers and community members, these aims stood up as being worthy and achievable. Education is seen as being a significant factor in providing opportunities to find positive ways to contribute to their communities. Programs such as Questacon's, delivered in an appropriate format and that acknowledge the importance of traditional Indigenous knowledge can assist the teachers in the schools to inspire the students to continue their studies at school.

The program currently being delivered by Questacon is the result of a reflective process, informal evaluation and a small, formal reflective study.

THE SCIENCE COMMUNICATION PROCESS

The Shell Questacon Science Circus has been delivering science shows in schools in regional areas across Australia since 1988. It is staffed by 15 science graduates studying for a Graduate Diploma in Science Communication. For work in remote Indigenous communities the graduates receive training in cross cultural communication and workshop presentation and work in small teams to deliver the program in schools.

Questacon presents programs to a wide range of audiences and understands the importance of tailoring a program to suit the particular audience. Australian Indigenous students, particularly those in remote communities, form a unique audience that requires a particular style of program. Factors such as a different culture, different language and geographic isolation all need to be considered.

Training in cross-cultural communication is seen as an integral part of the presenters' preparation. This is undertaken in three distinct phases:

- Broad cross-cultural training in which mainstream Australian culture is placed in a broad international context
- Training in Indigenous Australian culture and practices by Indigenous presenters. This incorporates training from both an historical and social context, as well as cross-cultural protocols

- Specific training in cultural protocols in the area that the tour is to be undertaken. This is usually delivered by a member of the local community who is very familiar with the areas that will be visited and who generally supports the educational basis of the program we deliver in the individual communities.

Other training includes remote area driving skills, designing and facilitating activity workshops and first aid.

Each team of three presenters usually spends at least two days at each school and has several different periods of contact with the students.

Pre-visit materials are sent to teachers several weeks in advance. These materials describe the program, outline key language and suggest activities that could be done before the team arrives. Post-visit materials are also provided with a wide range of follow up ideas for teachers to draw from. These pre- and post-visit materials encourage teachers to set a context in the school before the Science Circus team arrives and to help the students explore ideas further after the team leaves.

Because English is often a second or third language for the school students our presentations are short, and visually engaging. The main part of the program is in a workshop format with the presenters working alongside the students investigating and developing ideas.

The workshops can cover a variety of topics and rather than concentrating on content there is an emphasis on modelling the process of investigation. The presenters model ways of dealing with the questions, 'Why?' and 'What's going on here?' and 'I wonder what would happen if ...?' The students are then engaged in open-ended challenges and are encouraged to explore ideas of their own. This is important in many communities because the children often have not been encouraged to explore ideas analytically. They love to be involved and try things but the skills of analysing an event are not encouraged at a young age as they are in more mainstream Australia where questions like 'Why?' and 'How come?' are common.

One example of an activity used in some workshops is the use of a simple illusion. Two identical, curved cards are shown to the students and between two presenters the illusion that one card looks bigger is explored. The presenters play with the notion that 'something interesting is happening here!' They model trying to find out what is going on. They try different sized cards or looking at the cards with one eye closed. Then at some point they invite the students to join in the exploration. Students then cut out their own curved cards and try different curves, different colour patterns, etc. They become engaged in the scientific process of investigation.

The practicalities of delivering such programs to remote communities can be complex. Travel from Canberra can involve five hours on a plane followed by eight hours driving. The Science Circus teams typically spend two weeks in a region visiting remote schools and travel by light aircraft, four wheel drive vehicle and sometimes small boat. Baggage space is always limited. The team must carry their personal belongings, bedding, food and the materials for the school program. Accommodation is sometimes in a spare teacher's house but is often on the floor of the school.

Arrangements can often change unexpectedly as the teachers in the schools respond to local events. If there is a death in the community the school will be closed and visitors may not be permitted into the community. Rain can often cause the roads to be closed.

Whilst most workshops are presented in classrooms it is not uncommon for presenters to find themselves working in a dry creek bed or under a tree.

The program then, needs to be flexible in terms of timing, physical requirements and materials used. Because space in the vehicles is limited, where possible materials are drawn from the community environment, although the schools do appreciate it when new materials are brought in for the students to experience.

EVALUATION

The program is still in its early days and it has not been possible to conduct a long term study to assess the change in attitudes or involvement that may have occurred as a result of the community visits. However, since 2001 a cycle of reflective evaluation has informed the development of the program.

Discussions held with teachers before the community visits guide the development of the program. Feedback from teachers, students and presenters after the delivery of the program is then used in the shaping of the next year's program and is used in the discussions with teachers from the new region being visited.

It is interesting to note that in the period 2002 – 2004, 98% of schools involved reported a very positive response to the visits by the Science Circus with a common comment being a request for the team to visit again and stay for longer.

In 2003 a more formal evaluation of the effectiveness of the visits was conducted. In 'Questacon's Indigenous Programs': Evaluation Comments on the Shell Questacon Science Circus Visit to Arnhem Land, NT, 2002, (Mascini P., 2003) it was concluded that:

'The programs themselves, as they have been delivered in the past two years, are well received by both staff and students. Key elements of the existing program that are successful and should be maintained include:

- Presenter cross-cultural training
- Personal visits to schools of several days duration, allowing effective working relationships to be established between presenters, staff and students
- Hands-on and activities based approach to learning
- Strong visual element and activities that are not heavily embedded in the English language
- Flexibility of presenters and program content to accommodate needs of individual schools and class groups
- Excellent personal and professional development opportunity for presenters

Whilst the programs are working in their current form, this evaluation set out to try and identify areas/ways in which they could be made more relevant to the schools, both from an educational and a cultural perspective. To improve the effective delivery of the Indigenous Outreach Programs, teachers consistently identified the following areas:

- Prior knowledge of the program content and activities to allow class preparation by teachers. At least four weeks notice would be required to allow both concept and language introduction to the students.
- Provision of follow-up resources, either in hard copy or by electronic means. Given the poor internet reliability in some areas, CD-ROM may be the most effective means of providing such information. It must be said that resources were left with schools after the visits in 2002, which also highlights the need for;
- Reliable points of contact within the schools to ensure distribution of information to staff. As pre- and post-visit contact becomes a more important component of the program, a dedicated point of contact within Questacon should also be established.
- Development of new topic areas that focus on topics that students in remote areas are familiar with, including environmental and biological themes. Both new and existing programs must not have a strong reliance on subject matter that is based on the English language.'

DISCUSSION

The visits over the past four years by the Shell Questacon Science Circus to remote Indigenous communities have highlighted the need to understand the relationship between an audience and the presenters. It is important to recognise barriers that may exist and to adapt the presentation mode and style to suit. This is important in all forms of communication and is brought into sharp focus for the Science Circus presenters when they take programs into Indigenous communities.

Even in the same city different schools may have markedly different 'school cultures' and the presenters of a visiting science communication program must accept the context in which the program takes place and adjust accordingly.

It is tempting for the Science Circus presenters to feel they should be trying to solve the health and social problems of the communities they visit and it is important that they realise that the program they deliver will make a positive contribution. If they can provide the students with a taste of the excitement of learning in general, and science in particular, and the teachers with a collection of ideas for further investigation then this is a significant contribution to the challenge of encouraging students to continue attending school.

The Science Circus involvement in Indigenous Outreach programs has spawned a number of other programs designed for Indigenous people - all adopting similar operating principles for working in remote Indigenous schools.

Questacon is developing programs that aim to reach the wider community beyond the school and engage with the holders of traditional Indigenous knowledge. These programs emphasise the sharing of knowledge and provide a platform for Indigenous people to share with the world their knowledge of their environment and at the same time highlight the modern technology that has become a part of their everyday community life.

CONCLUSION

Communication, and in particular science communication, with people from different cultures is a complex task. Successful engagement is a first step with significant challenges in itself.

Questacon has developed an approach that is successful in engaging with Indigenous students in remote schools in a relatively short time. Whether or not this achieves a long lasting impact is still unknown and this question will be built in to future Indigenous Outreach programs.

REFERENCES

- Claire McLisky, Diana Day, *Black and White Science: Encouraging Indigenous Australian Students into University Science and Technology*, University of Sydney, 2004
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