

# Indigenous Heritage Database Project

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## **Introduction**

The paper describes an investigation into a methodology for building digital research collections based upon the Indigenous Research Partnerships initiative at La Trobe University. The pilot project was undertaken in collaboration between the La Trobe University Library and two Indigenous Research Partnership communities.

The genesis of this project began after a long period of collaboration between the Audiovisual Services area of the library and various academic areas of the University interested in using digital media resources in their approaches to research and teaching. In particular, a very fruitful collaboration had been ongoing with both the departments of music and archaeology. (Chrisfield et al., 2000)

In November 2000 La Trobe University held a forum at the Bundoora campus to enable the University to consult with a number of indigenous communities.

Participants came from Alice Springs and Yuendumu in Central Australia, Yirrkala and the Donydji Homeland Centre in eastern Arnhem Land, Ngatjan and the Waribarra Mamu in far north Queensland and communities in Melbourne and regional Victoria.

Fourteen delegates representing these and other indigenous communities were welcomed to the Bundoora campus by Vice-Chancellor, Professor Michael Osborne.

Indigenous Research Partnerships Advisory Committee forum chairperson, Dr Neville White, said La Trobe's 'indigenous partnerships policy' emphasised the 'reciprocal obligations and responsibilities such partnerships demand'. The outcome of the forum led to a proposal to develop a University Centre for Indigenous Research Partnerships and, included in the recommendations from the delegates, a request to investigate the development of a multi-media database of indigenous cultural heritage.

The Aboriginal elders' request for the development of a multimedia database of cultural heritage objects by La Trobe University led to a successful application to the Library Research and Development Committee for the Indigenous Heritage Database project. The project began in July 2002.

## **Project Aims**

1. To investigate a methodology for the electronic capture of research data being generated by two particular indigenous research project partnerships.
2. To investigate a methodology for the indexing of this data.
3. To investigate options for the provision of appropriate authentication and authorisation protocols to enable online access to the data for the three primary client groups; the two indigenous communities, the Ngatjan people of far north Queensland and the Yolngu people of north east Arnhem Land, together with the authorised researchers.
4. The examination of ethical issues in the dissemination of digitised cultural property.

## ***Anticipated Benefits of Project for the Library***

1. Development of expertise in the indexing and dissemination of research data as it is collected.
2. Development of an improved understanding of the role of information technology and online resource development in research and teaching and the benefits to indigenous communities.
3. The establishment of collaborative research and development partnerships which enable Library services and support to be improved for our clients.
4. To apply the current Library information technology infrastructure and expertise to a new area of knowledge, which should develop a better understanding of metadata approaches to resource indexing and discovery in collaborative online research and learning applications.

## **What was done?**

### ***The approach***

At a meeting of the research team on April 19, 2002, when the possibility of support from the Library looked promising, we began to take a 'reality check' about what we could achieve over the next six month period.

We cut back on our plans considerably, in consultation with the Library Research Committee, and put the plans into achievable 'bites'

The two primary objectives –

1. To investigate a methodology for the electronic capture of research data being generated by two particular indigenous research project partnerships.
2. To investigate a methodology for the indexing of this data.

It was decided that we would best achieve our objectives by making our pilot project into a GIS project. That is, to use the data provided by the two communities and placing it into an already developed GIS system.

This notion arose out of the fact that both research groups were agreed that the primary access approach will eventually need to be a spatial one.

Neville White and Bernhard Schebeck had already invested a lot of time in developing an approach to 'mapping' their research data using ArcGIS 3.1.

The School of Archaeology had also been using this software in their work and intended to develop this further.

In order to develop a better understanding of this approach the Library supported the attendance of Ted Chrisfield at a workshop at the University of Sydney in September 2002. This workshop was hosted by the Archaeological Computing Laboratory, University of Sydney, which had

already been brought to the attention of the group because of an excellent conference paper which had been provided by the director of the facility in 2001.

*“Humanities data is particularly rich in spatial, as well as temporal, information, and we have long-established analogue methods of representing such information through the abstraction of maps. Computers extend the potential of the map with interaction, on-demand data-driven rendering, three dimensional visualisation and map animation. The Internet extends the potential further by providing new means of harvesting and combining information, and new channels for distributing results.”* (Johnson)

The workshop was an excellent introduction to the world of Geographic Information Systems and, in particular, the importance of the underlying data structures and standards which are the foundations of these systems. In 2002 we revised our project plan and gained approval to purchase a licence for ArcGIS 8, with the intention of turning our project into a GIS project.

The main rationale for this decision at that time was:

- Dr Ian Johnson’s recommendation at the at the Archaeology Computing Library conference.
- This platform had already been selected by the LTU Archaeology Department.
- This was also the platform which Dr Neville White and Dr Bernhard Schebeck were using in their work. *However, this was an older version of the software, which would later prove to be very significant.*

So, in the limited time available to us for the remainder of the year , we got ArcGIS 8 up and running in the three locations, the Library, Archaeology and Genetics and thought we were on the right track.

A significant attraction was the opportunity for a single ‘reference’, i.e. the **GIS** reference as a common metadata tag to begin to index all the digital ‘objects’ and then ‘overlay’ other information schemes as required from the investigations being made by the team member investigating the metadata issues, Dianna McClellan.

### ***Technical Challenges***

Upon further investigation we had to abandon this approach because it became obvious that this path was far beyond our resource capabilities.

- ArcGIS 8 was a completely different operating environment to that used by Bernhard Schebeck, ArcGIS 3.1. A change would require a major investment of time and effort, which neither Bernhard or our group could afford.
- The complexity of the ArcGIS 8 environment was a major learning curve which our group could not afford to begin to undertake.
- We all agreed that the best approach was to keep the resource capture and cataloguing approach to be independent from any system operating environment.

## ***Project Outcomes***

The broad aims of the project were the investigation of a methodology for the electronic capture and indexing of a range of research data, the investigation of authentication and authorisation protocols to provide online access to the data and the examination of ethical issues in the dissemination of digitised cultural property.

The knowledge gained throughout the two year project could now be applied in a number of ways across the University. In the two year period, since the project was funded, both the environment we operate in and the information tools available to us have changed dramatically.

For example the use of digital video tools, such as digital camcorders and video streaming, is just one example of how more accessible these approaches to data collection and analysis have become in recent years. (Ansenio et al, 2002.)

This trend will continue strongly in the future and became very evident by the number of papers given at the recent 'Computing Arts 2004' conference at Newcastle, but particularly by the two pre-conference workshops offered; Creating and managing digital audio for research and Introduction to GIS in the Humanities (University of Newcastle).

Also the ability to use the World Wide Web as a research tool to learn about related work being undertaken, both within Australia and internationally, has also increased and improved.

Both of these developments have informed our understanding and enabled decisions to be made about the directions which we would now like to take. The remainder of the paper discusses these directions together with a brief rationale.

- ***Using the available and growing digital information infrastructure***

In May 2003 the La Trobe University Library created the new position of Digital Audiovisual Projects and Services Librarian, which has allowed the project leader to move across the University in order to develop proposals in collaboration with academic areas to improve access to digital audiovisual resources to support the research and learning teaching programmes of the University. This year, 2004, the library has provided a particular focus for a group of subjects wishing to use digital images and digital video in association with the library e-reserve resources. The University is already seeing significant improvements in online support in a number of discipline areas.

This success can also be attributed to the fact that Australian copyright law now provides the tertiary education sector with specific copy licence agreements which have dramatically improved access to online resource support for learning applications.

- ***Modes of Scholarly communication***

The term **e-Research** (Australian Research Council, 2004), (e-Science in the UK context), is used to encapsulate those activities based on the invention and exploitation of advanced information and communications technologies. These activities include:

- Generating and analysing research data:
  - from experiments, observations and simulations,
  - providing quality management, preservation and reliable evidence;

- Developing and exploring models and simulations:
  - enabling computation and data at extreme scales,
  - providing trustworthy, economic, timely and relevant results; and
- Enabling dynamically distributed virtual organizations:
  - facilitating collaboration within the research sector and with industry through information and resource sharing;
  - providing security, reliability, accountability, manageability and flexibility.

The internet also provides access to a wealth of information about other communities engaged in various research and development activities directly related to the areas we were investigating. This project enabled us to discover and make connections with many of these vibrant and supportive international communities.

### **Building new collaborative communities**

- ***Geographic Information Systems***<sup>1</sup>  
The Geographic Information System Community (ECAE, 2004)
- ***Digital audiovisual media standards***

The success and availability of digital AV media to support research and learning can be attributed directly to the take up and developments of the various media formats in the computing, broadcast, motion picture and music industries.

La Trobe University's Library now relies upon the high definition, accessibility, versatility and further development of the **MPEG** (Motion Picture Expert Group, 2004) Standard to provide further innovation in support for research and learning at LTU.

### ***Metadata and the Indigenous Cultural Heritage Database*** **- Dianna McClellan**

Participation in this project has been a valuable learning experience. In order to gain a greater understanding of evolving metadata schema and their application in a rapidly changing environment I attended, where possible, meetings, training programmes, conferences, and undertook formal study. A Geographic Information System (GIS) metadata schema, in particular ESRI GIS was central to this investigation. It was beneficial to utilise the tutorial software to understand the potential of applying the ESRI GIS software to the project and the metadata schema accompanying the software.

Complementary to investigating metadata standards and schema was the need to learn about Indigenous people, in particular from the two regions central to the research project, namely Arnhem Land and the wet regions of northern Queensland. An important project undertaken as part of formal studies at Monash University was a survey of major Australian institutional web resources, namely museums, libraries, public records offices, and art galleries. A CD-ROM of potentially useful information and web sites was created as a result of this 2002 Masters project.

Communication with Neville, Bernard and Richard about their work and collections was essential. In 2003, both Neville and Richard supported incorporating the Indigenous Heritage Database project into a Masters thesis by research, moving from the course work stream. This has enabled the learning and application of research methodology and to be supervised at an academic level for a credible research outcome for the project.

### ***Scoping of the Resources***

During discussions with Neville about his collection of Arnhem Land material, complementary resources were identified by Neville as residing in other Australian institutions. Neville has taken action to retrieve a copy which originally belonged to him and Bernhard. Listening to some of Neville's tapes it was evident that there is a need to transcribe and to translate the contents in order to utilise the knowledge and to apply appropriate metadata. If the translation of these tapes is not undertaken soon, the language skills required to translate the Indigenous languages could be lost, together with the knowledge on the tapes. Neville and Bernhard were able to identify appropriate indigenous people who could undertake this translation.

It became evident, however, that the task of aligning field notes with the objects to be digitised and included in a database is a major undertaking. Originally I was including both Richard's and Neville's collections as part of the research to be undertaken for the two year part-time Masters project incorporating the La Trobe University research project. Not long after starting the Monash research project it was decided that Neville's collection on its own provided more than enough work for a Masters thesis. I discussed the matter with Neville and Richard and concentrated on Neville's collection. After discussion and a greater understanding of the extent of the task working with Neville's resources, I was advised by my supervisors to switch to the smaller, more organised and less complex project material forming Richard's collection.

At first it was suggested that I research Indigenous metadata visiting important institutions identified by my 2002 survey, such as the South Australian Museum, and interview relevant staff. The analysis of these interviews would then have provided the framework for metadata recommendations for the La Trobe University project. This approach was changed, first to two case studies based on Neville's and Richard's work, and more recently to one case study based on Richard's work. The results would then apply directly to the La Trobe University resources and could be used in an application for research grant monies.

Conversion of Bernhard's Indigenous geographical name work to an updated version of ESRI GIS has proved too difficult. While both Archaeology and Genetics are keen to use the software in their respective Departments and have purchased copies, the complexity and incompatibility of the recent version with the earlier version is disappointing. ESRI's portable hand-held equipment for use in the field is attractive as the database, once established, could be added to by students undertaking research work in the area and the metadata machine generated.

Standards for GIS metadata in Australia are undergoing a revision with the release of a recent international standard. The official body undertaking this work is the Australian and New Zealand Land Information Council (ANZLIC). It is attempting to incorporate the recently released international standard into Version 3 of their GIS metadata schema. AGLS (fmly the Australian Government Locator Service) is the official government standard for material other than GIS. Dublin Core is an international standard developed before the proliferation of more localised metadata standards. ANZLIC GIS is at variance with Dublin Core.

The literature on Aboriginal Australians has emphasised the differences which exist between each community; language, customs, religious beliefs, social habits, dreaming, relationship to the land, and so on. It is both slow and difficult to build up a good relationship with an Indigenous community so that there is both mutual trust and respect. Protocols have been documented to assist at various levels in order to assist in communication and relating to Indigenous people. Both Neville and Richard have built up a relationship of trust and respect with the Aboriginal communities they are involved with in their work.

### ***Results of the Research***

- 1) The Arnhem Land resources available for organisation require identification and alignment with field note records.
- 2) The Arnhem Land Aboriginal language material, in particular the tapes recording interviews, needs to be translated and transcribed.
- 3) The ESRI ArcGIS software globally utilised, and taught to students in Australian academic environments including La Trobe University would be ideal for the project. It would both align the departmental and discipline needs, both archaeological and anthropological to the Library's organisation and presentation of the material in a digitised online format.
- 4) The application of metadata is becoming more and more automated due to the expense and difficulty of applying it manually. The ESRI software offers this advantage together with input into the database by students and staff undertaking research at the location in the field.
- 5) The ESRI ArcGIS software when utilised in Australia usually substitutes the United States metadata schema standard with the Australian ANZLIC GIS metadata standard.

### ***Results of the Research - Practical Aspects***

- 1) Appropriate archival resources are required to organise the extensive and valuable Arnhem Land research collection.
- 2) Aboriginal language material needs translation and the tapes transcribed. Neville is in contact with Aborigines who could assist and Bernhard's language knowledge of Aboriginal languages is invaluable.
- 3) There is a need for a defined University policy and methodology for organising Aboriginal resources emanating from academic research work and the Library's role and responsibility in this University undertaking.
- 4) There is a need to address ethical issues and the long term impact on Indigenous communities if the research resources of this University are not made available.
- 5) This would appear to be a national issue with the Australian Government indicating their concern and assistance at repatriation and self-determination of Aboriginal Australians.
- 6) Metadata schema and standards adopted for this project are determined by the methodology and software used for this project.
- 7) User needs are paramount. There are many Aboriginal languages and terms used in different regions to describe the same object. These specialised language terms need to be identified and a list of these words and phrases compiled. There are two view points of the same geographic area or object, the European and the Aboriginal, the latter being intertwined with the dreaming of their people.

### ***In Summary***

The adoption of a metadata schema and standards is reliant on general methodology and the

software adopted for the project, for example, whether the two discrete collections are seen as individual projects and treated in different ways. If an automated metadata application software is an integral part of the software applied, such as in the case of ESRI GIS, rigorous arguments would need to be forwarded for adopting other than Australian standards. National and global interoperability are desirable, but to what extent should the needs of the user be compromised and is this desirable any way?

### ***What remains unresolved?***

Looking back over the research accomplished to date (as at 6 June 2004) the following areas remained unresolved and pose ongoing research questions:

- 1) By whom, when and how are the Arnhem Land resources going to be organised in preparation for inclusion in a database?
- 2) Are the Arnhem Land resources going to be considered in the adoption of software and database architecture?
- 3) What is the University's responsibility, policy and role in the repatriation of resources to the Indigenous communities?
- 4) What software are we adopting and how are we making available these heritage resources to the appropriate Aboriginal communities and for the research needs of this University?
- 5) How is adequate contact to be sustained by the Library with the Aboriginal communities?
- 6) Is it going to be practical for me to interview community elders and ascertain subject metadata for the Queensland Indigenous collection?
- 7) What metadata standards are we adopting? Apart from the specific schema there are other individual standards which should be incorporated into the database construction?
- 8) What level of interoperability is achievable by metadata schema and standards and its impact on user needs?

## ***Conclusion***

There is no more difficult challenge facing Australian higher education than the participation and whole-hearted involvement of Aboriginal and Torres Strait Islander students and staff within the University sector. Indigenous Australians experience profound disadvantage in many areas of their lives, in conditions which have been compared unfavourably to those in third world countries. Education can play a crucial role in improving the contribution of Indigenous Australians to the nation and thereby improve their quality of life. There is real potential to provide a research and development focus to assist both the Indigenous Research Partnership Communities and the University Research Community that could assist in resolving the challenges faced by indigenous communities. This will require a willingness to support this by both the indigenous communities and our funding bodies over the next planning period and, as the Australian Vice-Chancellors noted in 2004, to be effective, policies have to address a range of issues that impact on Indigenous Australians which include health standards and employment opportunities. (Australian Vic-Chancellors Committee)

Our project began with the intention of investigating a very small part of this challenge, to look at

ways of recording and developing a database of indigenous cultural heritage.

In relation to our objectives and anticipated benefits in relation to the role of the Library I believe we have discovered a great deal in our investigation. In our attempt to establish a small operational pilot system to demonstrate our approach we failed to achieve anything. But, with our limited resources, we found out a great deal of what we did not know which will inform any future opportunity to actually build such a capability.

## ***Where to now?***

The following projects are ongoing and at varying levels of completion.

1. Yolgu community – Dr Neville White

- Content selection and access control – Indigenous Research Partnerships

2. Ngatjon community – Dr Richard Cosgrove

- Content selection and access control – Indigenous Research Partnerships

3. Possible Collaboration with other research communities and projects

- Metadata

Dr. Jane Hunter, Distributed Systems Technology Centre, University of Queensland, ***Indigenous Collections Management Project***

- Geographic Information systems

Dr. Ian Johnson, University of Sydney, ***Timemap***

4. Possible Development in collaboration with existing Library expertise in digitisation projects and e-collection developments

- Audio and Video capture - LTU Library streaming system development
- Image capture – Library Image Database system development
- LTU online learning / WebCT developments
- 2005 Projects – Digital AV projects and services

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We would like to thank the La Trobe University Library Research and Development Committee for their support for the past two years.

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1

Geographic Information Systems (GIS) are software systems for the capture, storage, manipulation (analysis) and display of spatially referenced data (i.e. map data). They are distinguished from computer mapping systems by the ability to generate new data through analysis based on one or more map layers.

## **Appendix 1 - Ngatjan people**

(Extract from 'La Trobe University Bulletin, March 2002)

### **Forbidden fruit and how to eat them**

With abundant food supplies and ample shelter, a tropical rainforest is perceived as a Garden of Eden - just the place the first Homo sapiens may have inhabited.

'Not at all,' said La Trobe archaeologist Dr Richard Cosgrove. 'Rain forests were probably some of the last environments colonised by modern humans'.

And it was all to do with 'bush tucker'.

The problem lies with the fruits of the 'Garden of Eden' - and, nuts, leaves, plant stems and roots. Although many are attractive to human foragers because of their high protein and carbohydrate content, they are, to the uninitiated, literally forbidden being highly toxic or carcinogenic. Up to 14 per cent of the total rainforest vegetable diet is toxic if unprocessed. Yet around 14,000 to 10,000 years ago, after the last ice age in Australia, people began to treat these food sources to make them not only safe but also highly nutritious and tasty.

How and when did rain forest dwellers around the globe - particularly those in north Queensland - begin to detoxify forest food?

A researcher in Aboriginal stone tool technology, Dr Cosgrove is combining his interest with that of Dr Judith Field of the University of Sydney, a specialist in starch grains and plant residue organisms.

Together they have received an ARC grant of \$280,000 over three years to probe the history of Aboriginal occupation of rain forests. Working closely with Aboriginal groups around the Innisfail region, Dr Cosgrove finds stone implements up to 10,000 old - and Dr Field analyses the organic residues on them.

Dr Field hopes to pin-point the age of the plant residues on the stone implements and identify the species of plants from which they came.

The project is in its early days. But Dr Cosgrove's work on stone tools, which goes back two decades and the close relationship established with local Aborigines, set the project off to a flying start.

He has identified hundreds of stone tools - including the mysterious Ooyurka - over the years and examined scores of the nearly 20,000 axes, grinding stones and other stone implements ploughed up in cane fields in the last half-century. The Ooyurka is believed to have played a role in the processing of rain forest food, but its exact purpose remains unclear. Ground into a T-shape in soft slate with the top edge of the T scraped flat, it is between 15 and 30 cm long. While many prehistoric Queensland stone implements are similar to those found in equatorial rain forests in Africa, central and South America and New Guinea, the Ooyurka is unique to Australia.

Dr Cosgrove believes it was possibly used to process nuts, fruit or highly silicious vegetation before it was placed in baskets made of lawyer vines and submerged in a running stream to leach out alkaloids or carcinogenic substances.

Trial and error must have been a part of the process although it was more likely that smell and the bitter taste were used as indicators of the presence of toxic alkaloids. For example, cycads are carcinogenic when eaten - but the cancers they cause would not become evident for many years. It is hoped that Dr Field's analysis of material found on a large number of Ooyurkas may present a clue about their purpose.

Some of the food inedible in its raw form is still used today by members of Jirribal (Murrie Upper), Mamu and Ngajan people who live around Innisfail and on the edge of the Atherton Tablelands.

Today's Aborigines still use stone tools in different processes to 'decontaminate' bush tucker - but they have no knowledge of the Ooyurka except as an ancient artefact. Part of the research project will be to compare the 'raw ingredients' used by modern Aborigines with that found on prehistoric implements.

While research excursions into the rainforests are mainly about food, they are no bush picnics. Some sites are so remote a helicopter is necessary to access them while others are reached by four-wheel drive vehicles or on foot over steep terrain.

Dr Cosgrove, La Trobe archaeology students, and representatives of local Aboriginal groups will locate new sites and dig for more stone artefacts and organic remains. After examination, all artefacts go to the Queensland Museum.

Research to date has already placed in doubt one 'established' theory - that humans inhabited rain forests only after they had set up agricultural practices elsewhere.

The theory was that as rain forest plant food was highly scattered and energy intensive to produce, another source of food was required to supplement game hunted in the forests. Ingeniously toxic plants were made safe to eat, allowing a greater array of highly nutritious bush tucker to be incorporated into their diets. Subsequently the wet tropics of Queensland had one of the densest Aboriginal populations in Australia.

According to Dr Cosgrove, the fact that early Australians in this area did not practice agriculture and had limited access to marine foods - but they inhabited rain forests from at least 5,000 years ago - would tend to discredit this theory. Evidence was also coming to light that humans have inhabited rain forests in the Congo and in South America between 9,000 and 10,000 years ago

The team may also find an answer to the question of whether the 'technology' used to detoxify rain forest food was imported or evolved in Australia. Knowledge of processing plants into food was quite common in many early cultures. The answer will depend to some extent on the Queensland residues found and their age.

## **Appendix 2 - Yolngu people**

(Extract from La Trobe University Bulletin, June 2004)

Research by La Trobe University in North-East Arnhem Land strongly supports the view of traditional Aboriginal leaders that Homelands offer the best hope for the future of their young people.

These Homelands, unlike most towns and larger settlements at the top end, have remained free from substance abuse and destructive behaviour as a result of strong customary leadership and family support.

Now La Trobe University - through a variety of initiatives led by Associate Professor in Genetics, Dr Neville White, and involving postgraduate students engaged in health, environmental and educational research is helping the local Yolngu Aboriginal community attract its youth to these Homelands, especially young men from the larger settlements.

These initiatives are titled the 'Mittjiwu Djaaka' project, which translates as 'caring for our community'. They include training, employment, life skills and health education programs as well as support for community campaigns to fund improved accommodation and living conditions on Yolngu Homelands.

The Rotary Club of Melbourne is supporting the project and Vietnam Veteran volunteers are helping with vocational training and building programs.

Dr White says about 5,000 Yolngu people live in North-East Arnhem Land. About seventy per cent spend at least part of their lives in Homeland Centres - small, remote, family-based communities linked to parts of the religious landscape of the Yolngu.

'These centres have a strong traditional orientation. Some residents rarely leave their ancestral lands. Young men in these Homelands are engaged in subsistence activities and are subsequently healthier. 'In larger settlements and towns a high burden of male morbidity and mortality falls on indigenous youth and early middle-aged men,' says Dr White.

'Much of this results from poor nutrition and self-destructive behaviour, including substance abuse - alcohol, kava, marijuana and petrol sniffing. This behaviour is now also becoming evident amongst women in the larger centres.'

'Health statistics paint a grim picture', says Dr White. 'For example early middle aged Aboriginal men have a death rate nearly 11 times that of the total Australian age group. Only three per cent are older than 65 years, compared with 13 per cent in the general population.'

'Life expectancy for Yolngu men is 57 years, compared with 74.5 years for Australia in total. And for the women it's 60 years - 20 years less than for other Australian women.'

'Education statistics are just as bad: only seven per cent of young indigenous Australians have completed year 12 compared with 30 per cent of the general population. In North-East Arnhem Land that figure is less than one per cent.'

'It is becoming clear that self-harm among youth is closely associated with educational disadvantage and boredom resulting from lack of meaningful employment opportunities.'

So Dr White and a group of La Trobe students, in partnership with outside service agencies and Yolngu stakeholders, are working towards a solution.

'But it is essential that intervention programs are driven and controlled by the Yolngu communities involved,' says Dr White, who has worked in the region for some thirty years. To this end staff and students regularly visit Arnhem Land to work closely with local communities. They support and help leaders of Homeland Centres develop projects in the areas of health, community infrastructure, resource management, political advocacy and education.

And Yolngu representatives often visit the University, maintaining a two-way flow of information. Dr White says some early successes of La Trobe's links with Homeland Centres have been programs helping to train rangers and land managers. These programs were carried out in association with Northern Territory Parks and Wildlife.

Dr White led the development of a community-based Ranger Program, funded by the National Heritage Trust. It incorporates five Homeland Centres responsible for the management of the Heritage area.

'For example, we have been partners in a project documenting plant and animal communities on the Arafura Wetlands for the Register of the National Estate to help local custodians protect the unique cultural and natural values of their area.'

Some other projects have involved regional surveillance with NorForce, Customs and Quarantine; health worker training through the Gapuwiyak Health Centre; and teacher training through Shepherdson College, on Elcho Island.

Dr White says a recent 'very rewarding community capacity building initiative' was the Donydji School and Community Centre, a partnership project involving local residents, Rotary International, the Potter Foundation and La Trobe University.